VOLUME XLVIII NUMBER FIVE

# THE NATIONAL GEOGRAPHIC MAGAZINE

NOVEMBER, 1925

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TO carry out the purposes for which it was founded thirty-seven years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, sprouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.


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# *This* Accurate Watch Keeps America's Crack Trains on Schedule

## Why the fastest trains in the world are timed with this watch.

"WHAT TIME HAVE YOU?" Ask this question of a group of business men. Out come their watches. One watch is three minutes slow, another five minutes fast, and so on. But ask this question of a group of railroad men. If there is any variation it is usually only a matter of seconds.

Yet it is so very easy for every business and professional man to have a watch as unfailingly accurate as the railroad man's. When you buy a watch get the make he uses. For thirty years there has been one watch that has been generally favored on America's railroads, a watch that has earned the unique distinction of being called "The Railroad Timekeeper of America."

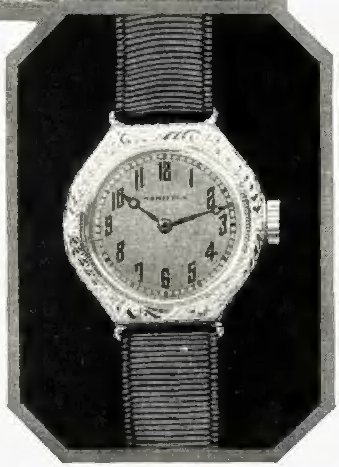
This watch of accuracy fame is the Hamilton. It rides in cab and coach of such famous fliers as the Twentieth Century, the California Limited, the Broadway Limited and the Olympian. When you buy a Hamilton, accuracy is assured.

The secret of Hamilton's accuracy is capacity to take infinite pains. With us every watch is an individual piece of fine mechanism, tested and retested until final accuracy is obtained.

No Hamilton leaves our factory until it has proved itself worthy of the Hamilton name, and is ready to serve you as an accurate timekeeper. This insures the quality of the Hamilton Watch that you purchase and enables us to give a broad guarantee of satisfaction.

*The watch above is the new Frodsham design. Hamilton Watches may be had in yellow, white or green gold—14k or filled, plain or engraved. Prices $48 to $250. You can choose from a wide variety of cases and dials.*

*The Twentieth Century Limited speeding along the shores of the Hudson River. This is one of the famous fliers timed by the Hamilton. (Picture reproduced from an oil painting, copyright, 1923, by the New York Central Railroad Co.)*



*Above is the new woman's Tonneau model wrist watch. Milady's Hamilton comes in silk ribbon models, detachable bracelet models and strap models. Cases are plain or engraved in yellow, white or green gold, 14k and filled. Prices $46, $48, and $60.*

A Hamilton Watch to suit your individual preference may be selected from a number of beautiful cases and dials. Some are simple, graceful, and chaste. Some are beautifully engraved and ornamented. All have an intrinsic beauty that will keep them fashionable after years of service.

Ask your jeweler to show you a Hamilton today. He can show you Hamilton pocket and strap watches for men and charming wrist watches for women. Send for a copy of our new illustrated booklet, "The Timekeeper." Address Dept. 1-C1, Hamilton Watch Company, on the Lincoln Highway, Lancaster, Pa., U.S.A.

**Hamilton Watch**

*The Watch of Railroad Accuracy*

# *The New Cadillac Emerges Triumphant in Every Contrast*

Paraphrasing Kipling:—"A Six is a Six and an Eight is an Eight, and never these twain shall meet."

You cannot get Six riding and driving qualities in a Four; nor Eight riding and driving qualities in a Six.

Nor, by the same token, can you secure Cadillac Eight riding and driving qualities in any other car but the new 90-degree Cadillac.

Is this mere say-so or braggadocio?

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*All prices quoted F. O. B. Detroit. Tax to be added*

*The privilege of deferred payment, over a twelve months' period, is gladly given on any Cadillac car*

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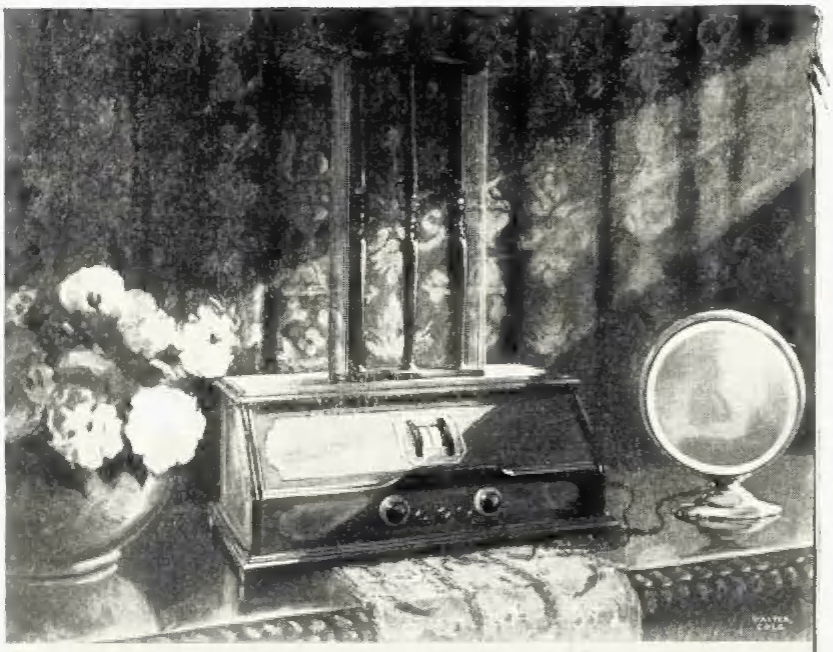

# *New* principles in radio *developed by* RCA

The new Radiolas, embodying new principles of radio reception, are not only the product of RCA, but have behind them as well, the research facilities, the engineering and manufacturing skill of General Electric and Westinghouse. They meet, with new standards of achievement, *all five fundamentals* of good radio reception.

1. ***Quality of tone***—New Radiotrons and new RCA Loudspeakers mean perfection of tone never before achieved.

2. ***Volume of tone***—The new Radiotrons make possible tremendously greater volume of tone.

3. ***Selectivity***—The Super-Heterodyne is known to be the most selective set on the market, and this selectivity has been carried to an even greater degree of exactness.

4. ***Range***—Power amplification has brought *improved distance reception.*

5. ***Simplicity***—The new uni-control system at last brings single control operation to complete, practical success. And some of the new Radiolas can be operated entirely on the house current without batteries—a final step in a series of achievements that put radio today many strides ahead.

**Radiola 25** (pictured above with Loudspeaker Model 100), a six tube uni-control Super-Heterodyne, that uses the new power tube. It has space in the cabinet for dry batteries, but can be used with Loudspeaker 104 without batteries. With 6 Radiotrons but without loudspeaker . . **$165**

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With 5 Radiotrons. . **$115**

**Radiola Loudspeaker, Model 100,** RCA Cone type, achieving new clarity and far wider tone range. Can be used with any radio receiver . . . . . **$35**

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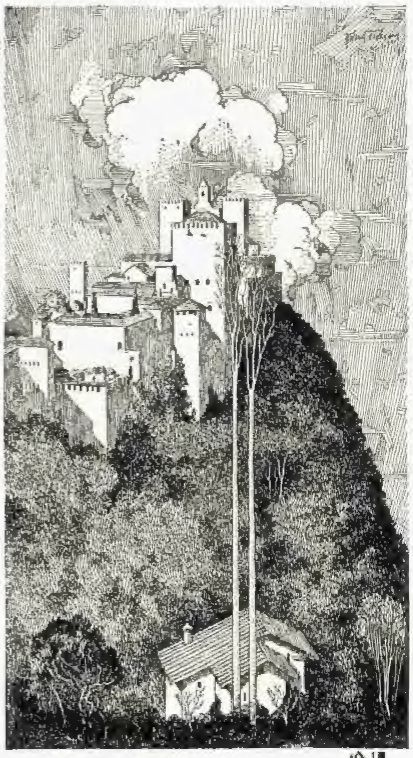

The Red City—
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*One of a series of little biographies of Elgin Watches*

. . . WRITTEN BY EMINENT ELGINEERS

* * *

It was Oscar Wilde who wrote that "a man will kill the thing he loves," and while I would not care to confess to being a time-killer, I must admit that I have submitted my watches, for which I had a real affection, to many punishments, including the water test.

For in my younger days, I served as coxswain of an eight-oared shell, and in one dramatic practice spin on the Schuylkill, the boat was swamped and the crew made a most inglorious exit from the water. I swam ashore, but the watch that went overboard with me—my father's and a fine English make—was never quite the same.

My second watch was a gift from my mother on my twenty-first birthday. It served me faithfully for several years and then for reasons best known to itself, suddenly lost its reputation for unerring accuracy.

With no little reluctance I discarded it, and purchased an Elgin which, decade in and out, has never miscounted a minute that I've been aware of. It has won my regard as a true friend, on which I can rely almost to the second.

*by* JOHN DREW

ELGIN

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# A wonderful two years' trip at full pay–

## *but only men with imagination can take it!*

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And imagination rules the world.

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*Please write plainly*

Business Address.....

Business Position.....

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Buick has been building better and better motor cars for more than twenty-one years!

And in all those years, no Buick car ever has more fully represented the Buick ideal or made the Buick promise mean more than today's Better Buick.

This is the car with 75 horsepower performance; with a finer Buick Valve-in-Head engine, now "Triple Sealed," to protect it from dirt, wear and upkeep expense. The Better Buick is the car with the charming new body profiles and striking new color combinations in Duco, some in Duotone; with Controllable Beam headlights; and many other important chassis and body refinements.

And this is the car that establishes a new standard of motor car value. It is the same sturdy, reliable, desirable Buick you always have known, but better in every way. At its present prices, it stands alone as today's most attractive motor car investment.

Drive the Better Buick and you will be convinced that Buick again has fulfilled the Buick promise—and built a better automobile!

BUICK MOTOR COMPANY

Flint · *Division of General Motors Corporation* · Michigan

*Canadian Factories:* McLAUGHLIN-BUICK, *Oshawa, Ontario*

Branches in all Principal Cities—Dealers Everywhere

Pioneer Builders of Valve-in-Head Motor Cars

*The Better Buick*

# "The voice of the people"

IF you are confused about Radio—if the din of conflicting claims and statements has left you more puzzled than ever—turn to the one infallible test—

*the consistent preference of the public.*

Choose wisely by analyzing the judgment of the multitude who have already made a careful selection. Their choice is summarized in the circle above. Study it! It shows by official figures that to *an overwhelming degree* Freed-Eisemann is the largest manufacturer of Neutrodyne Radio Receivers in the world.

Freed-Eisemann *pre-eminence is founded on* ACCOMPLISHMENT.

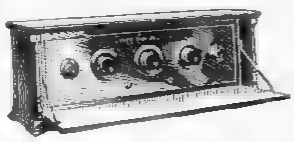
Back in the very beginning of the Radio industry, even before the days of general broadcasting, Freed-Eisemann engineers were already perfecting tone, simplicity and selectivity.

The new Freed-Eisemann sets mark the furthest advances in Radio engineering.

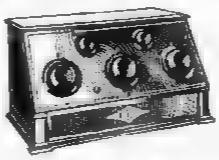
*Without cost or obligation—*
*A home trial for a liberal period*

Our dealers are so sure of the performance of the Freed-Eisemann that *this week* they will gladly install a set in your home *without obligation*—so that you may learn the joys it will give you. Telephone the Freed-Eisemann dealer today for your set.

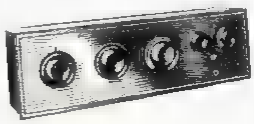
*Freed-Eisemann Radio Corporation*
MANHATTAN BRIDGE PLAZA, BROOKLYN, N. Y.



NEW! NR-45 $100.00
*A de luxe six-tube Neutrodyne * receiver, remarkably selective, in handsome cabinet*



NEW! FE-18 $90.00
‡ *A new five-tube dry cell receiver; space for batteries in cabinet*



NEW! NR-7 $[illegible]
*A six-tube licensed Neutrodyne * receiver embodying an improved method of audio-frequency amplification*

‡ Licensed and manufactured under a group of Latour patents.
* Licensed by Independent Radio Mfrs., Inc., under Hazeltine pats. Nos. 1450080, 1489228, 1533858.

# FREED-EISEMANN

*Mastery in Radio*

# "Our Oil-O-Matic"

Two words define the well-ordered warmth in the modern home of today. "Our Oil-O-Matic!" Little is left to say. And nothing to do. Why, then, do owners like to talk of their Oil-O-Matic? For the same reason they discuss their yachts, or motor cars. Or any perfect piece of mechanism in which there is pride of possession.

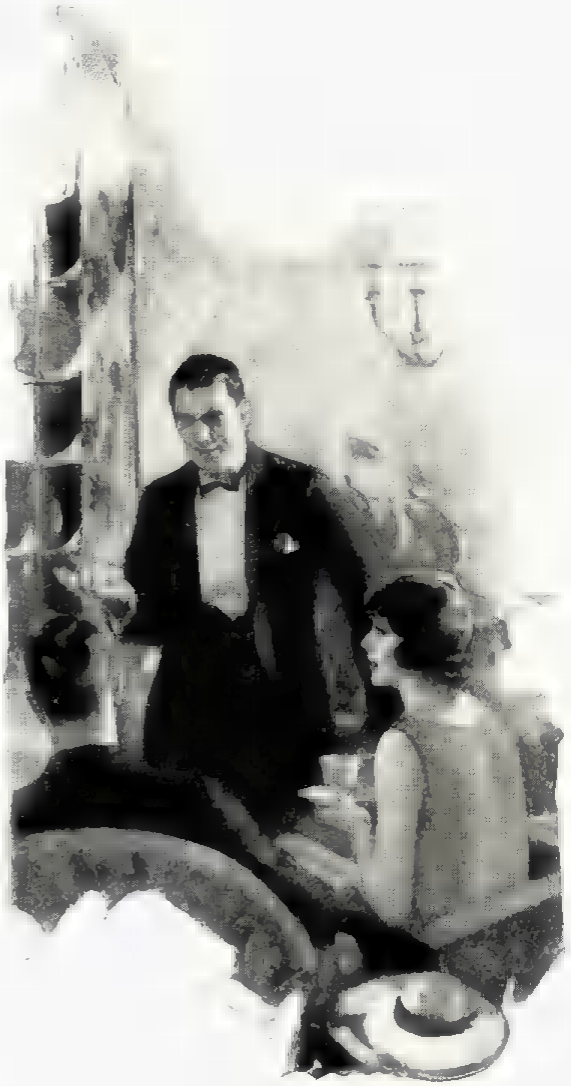
How it works, or why, is soon forgotten—if, indeed, the family ever knew! But let them hear an icy blast at the windows, or distant footsteps crunch cold, and someone always murmurs gratefully, "Our Oil-O-Matic!" It isn't human to forget the faithful, silent servant in the basement.

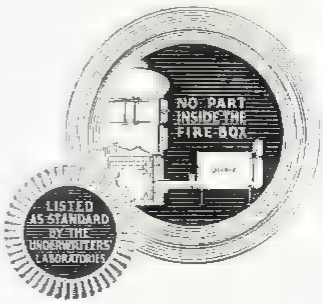
Guests come, and stay late. They feel no chill. No shovel gives ringing reminder of time to go. Formality is forgotten: "You have oilomatic heat, too!" And everyone is talking at once about the times when the finest residences burned—*coal.*

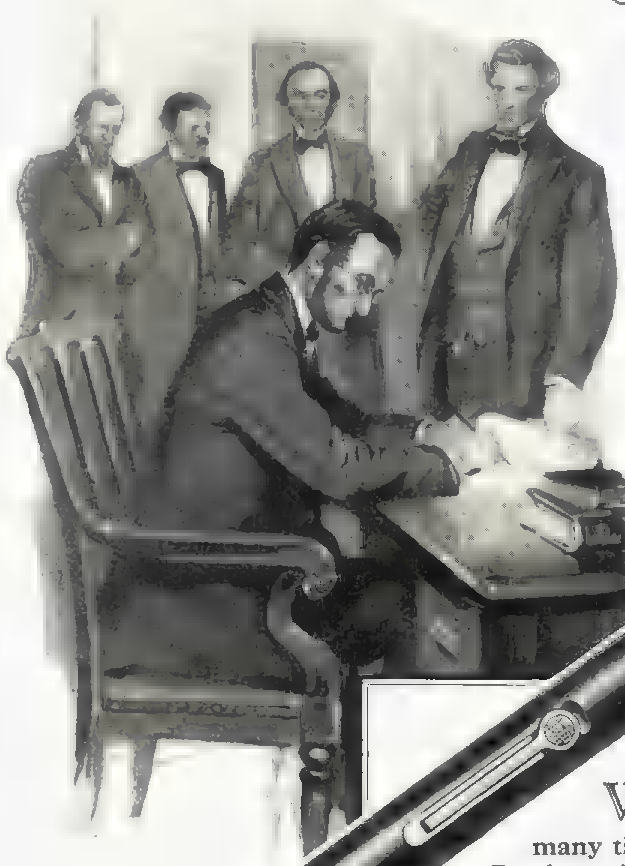
There's an Oil-O-Matic dealer in your town. He will act in time, if you do. Oil heat is economical. Terms of payment for equipment are easy. There is no excuse for another Winter spent like last! Shall we send BASEMENT PLANS and OIL HEATED HOMES? A book for your library *free.*

Williams Oil-O-Matic Heating Corp.
202 Washington St., Bloomington, Ill.

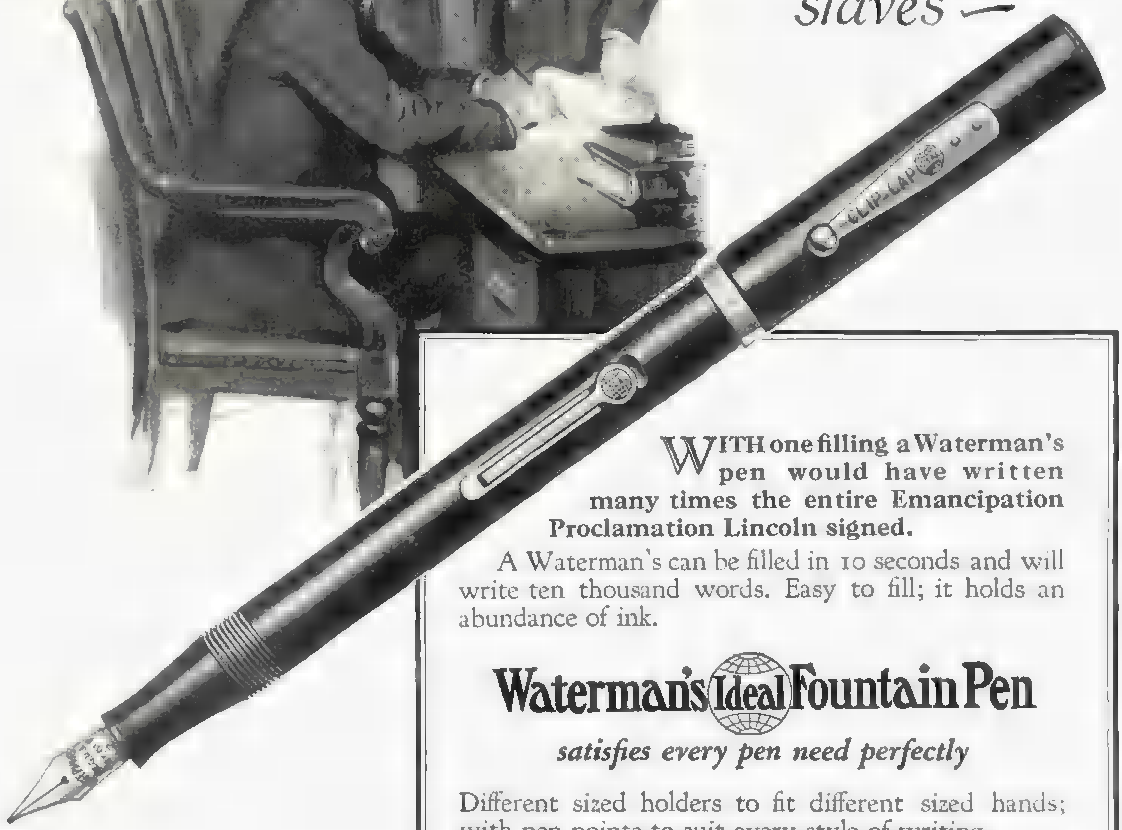
WILLIAMS
OIL-O-MATIC
HEATING







*With a few strokes of a pen* LINCOLN *freed the slaves —*




**WITH one filling a Waterman's pen would have written many times the entire Emancipation Proclamation Lincoln signed.**

A Waterman's can be filled in 10 seconds and will write ten thousand words. Easy to fill; it holds an abundance of ink.

## Waterman's Ideal Fountain Pen

***satisfies every pen need perfectly***

Different sized holders to fit different sized hands; with pen points to suit every style of writing.

The LIP-GUARD, the CLIP-CAP, the SPECIAL FILLING DEVICE and the SPOON-FEED are four outstanding features.

Ask any one of 50,000 merchants to show you style illustrated; with cardinal, black or mottled holders. Make your selection at $4.00, or in larger sizes at $5.50 or $6.50

L. E. Waterman Company

191 Broadway, New York

Chicago Boston San Francisco Montreal

**Illustration is exact size of $4.00 model. Made with cardinal, black or mottled holders.**

# Because a Scottish Printer Loved Shakespeare

## *This amazing bargain is possible!*

EVERY lover of good books owes a debt of gratitude to William Collins, Glasgow printer. It was he who made possible the extraordinary book pictured on this page—and this unparalleled opportunity for *you*.

Here in one beautiful volume are the complete works of Shakespeare—every word, every line the great master ever wrote. The story of its creation is a romance of love and devotion to an ideal. Collins had two great devotions in life: his craft—and Shakespeare. He had become famous for the making of beautiful books. But, like every great artist, he cherished a particular ambition. It was to create, through the medium of his craft, a fitting tribute to the greatest master of our language. This was to be Collins' masterpiece.

### All of Shakespeare in One Volume

The result startled the publishing world. He produced the complete works of Shakespeare in ONE single, beautiful volume—plays, poems and sonnets; every one complete and unabridged. The book was hailed as the greatest work of its kind ever made.

But Collins had not yet completed his work. He continued to refine and perfect his masterpiece. And here is the crowning triumph of his efforts. This new volume is bound in sumptuous soft brown leather, titled in gold. The pages are gold-edged. A thumb index affords instant access to titles. The type used is large and clear; the paper of such exquisitely fine weave that 1,352 pages are contained in the thickness of only an inch and a half.

A de luxe volume for a millionaire's library? No, Collins wanted his masterpiece to be within reach of all. He has actually reduced the price from that of his former edition. You can own this wonderful book for only $4.98. Here are the entire works of Shakespeare—a complete set of books in one volume—at a ridiculously low cost. It is a bargain that can never come again, for these books were ordered when the rate of exchange was far below par.

### *Examine it FREE*

We will gladly send this complete Shakespeare, imported from the Collins Clear Type Press, to the readers of the NATIONAL GEOGRAPHIC for free examination. Keep it for a full week, then decide. No cost or obligation. Simply mail the coupon NOW.

(711)

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**New York, N. Y.**

Gentlemen:—
Send me for free examination one of the imported copies of your ONE-Volume edition of Shakespeare's Complete Works, printed at Collins Clear Type Press and bound in genuine leather, gold-edged pages, thumb index. If I agree that this is one of the most remarkable books ever published I will send you $4.98 in full payment. Otherwise I will return the book at your expense.

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**WALTER J. BLACK CO.**
**7 West 42nd Street**
NEW YORK CITY, N.Y.

# You may hunt the wide world for a wood which combines all these qualities of American Walnut

THERE are many fine woods, each characterized by some outstanding qualities, but you'll find no cabinet wood that combines *all the* attributes as does our own lovely American Walnut.

Some have strength, some have beauty of color. Some have resistance to wear and some endure the climatic changes so fatal to most woods. Some have the ability to outlast the ages. But walnut combines all these gifts in a superlative degree

The finest examples of classic furniture-making, descended to us from the golden age of the Renaissance, are of walnut, exquisitely wrought by master craftsmen. Time seems only to have mellowed and enriched these priceless treasures.

Today leading architects and decorators turn to walnut when they seek to obtain the utmost of luxurious beauty in paneled walls.

And the best furniture makers are using American Walnut more than ever before. They know it gives satisfaction. The good furniture merchants are selling more walnut. They know they are building good will for their stores by so doing.

The public wants walnut because it recognizes its charm and practical merits. From this universal acceptance of walnut has grown a vogue such as no other wood ever has enjoyed.

***Important***—Naturally with such a vogue there have grown many imitations. Insist that your dealer guarantee the furniture you buy is real walnut, or, at least, that all exposed parts are of real walnut. You'll gain lasting satisfaction and service if you take this precaution.

AMERICAN WALNUT

"THIS IS THE WALNUT AGE"

Our book, "The Story of American Walnut," is now in its fifth edition. You'll find it full of fascinating information, beautifully illustrated. One chapter on how to recognize real walnut will aid you in making purchases.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

Room 936, 616 South Michigan Avenue, Chicago, Illinois

# "Let's not have the Millers— *he's such a bore!*"

IT WAS a week before their wedding anniversary. They sat down to draw up a list of friends for the party.

Many names went down on the list without question. The Robinsons — Clark and May. Harry Parker, who from small beginnings had made himself into the best known architect in the State. The Browns — Mary Brown can always be relied upon to be the life of *any* party, and Bob Brown is being prominently mentioned for Congress.

Yes, it was an easy list to draw up; until it neared its end. And then, she suggested Joe Miller and his wife.

"You went to school with Joe," she said, "and he was at our wedding. Of course, I know he'll be a drag—but I think we *ought* to have him."

Her husband frowned. "We've given many a party for people we *ought* to invite," he said. "But this is our own party. Let's make it a real success. Let's not have the Millers—he's such a bore!"

In how many homes in America is this conversation repeated, whenever a party is planned! How many men go through life like Joe Miller boring their friends, keeping their wives out of interesting invitations, and getting nowhere in particular in a business way?

And the tragedy of it is that there's no necessity for it. Any man—if he can spare even fifteen minutes a day and knows what to do with them—can make himself interesting and successful.

Why should Bob Brown be considered for Congress, while his schoolmate Joe Miller is not even considered for assistant office manager in the company that employs him?

Why does one architect go far, while another with just as much professional talent — has to scrape his pennies together to live at all?

Every successful man in America knows the answer.

You will know it, when you have spent an interesting evening in reading the wonderful little free book illustrated on this page. Your copy is waiting for you. It is called "Fifteen Minutes a Day," and it gives the plan, scope, and purpose of

## DR. ELIOT'S FIVE-FOOT SHELF OF BOOKS

—the famous home library that is an open sesame to real social and business success.

Every well-informed man and woman should at least know something about this famous library.

The free book tells about it—how Dr. Eliot has put into the Harvard Classics "the essentials of a liberal education," and how he has so arranged them that in pleasant moments of spare time you can get the knowledge of literature and life, the culture, the broad viewpoint that every university strives to give.

"For me," wrote one man who had sent in the coupon, "your little free book meant a big step forward, and it showed me besides the way to a vast new world of pleasure."

Every reader of this magazine is invited to have a copy of this handsome and entertaining little book. It is free, and will be sent by mail, and involves no obligation of any sort. Merely clip the coupon and mail it today.

P. F. COLLIER & SON COMPANY
250 Park Ave., New York City

By mail, free, send me the little guide-book to the most famous books in the world, describing Dr. Eliot's Five-Foot Shelf of Books (Harvard Classics), and containing the plan of reading recommended by Dr. Eliot of Harvard. Also please tell me how I may secure the books by small monthly payments.

NAME { *Mr.* / *Mrs.* / *Miss* } .....

ADDRESS .....

The publishers cannot undertake to send the booklet free to children. 3527HCY L

**[*Advertisement*]**

"William Willoughby!"

The newspaper came down to a level with the coffee cups, and Bill Willoughby's gaze traveled over to where Paula manipulated the toast rack.

"Now this must be serious, my dear," he bantered. "You never call me 'William' unless there's something important. If you ever 'Mister' me, I'll know it's divorce. What is it, Paula—just discourtesy—I apologize—but this item about Jock Hutchinson caught my eye and—"

"No, it's nothing you've done, guilty conscience," Paula broke in. "It's something you *ought* to do, and I know of course you'll be glad to do it."

"H'm, not so sure," from Bill.

"Bill, dear, it's that you must be *sure* to be home for dinner tonight, and a little earlier than usual, please."

"I'll be here, all right, sweet, but the early part—well, I had promised Barclay eighteen holes at Sunset this aft., and you know how short the days are growing."

"You and 'Barc' will just have to be content with nine, unless you want to go out earlier, because I want you here promptly on time tonight."

"Why, what's tonight, anyway? What gives this evening its special glow? Is this some saint's feast day?"

"No saint's. I'm afraid it's all yours, you old goose—your birthday!"

"Gosh! Another year! I plumb forgot it. Many happy returns, etc. What have you got for me?"

"Never mind, it's a surprise. There'll be one of Laura's best birthday candles on it—and your Mother has written you a special love letter, and I've—well, you be here at seven."

"Better drop in at the office and we'll go to lunch, Paula. I suppose you'll be down town, too, to buy the present."

"Your suppositions are based on your own way of doing things, William Willoughby. I have already got

***A Large Wahl Pen, $8.00***

your present. No; you don't get it till tonight. I'm proof against teasing. This is my secret. You shan't have it out of me. And if you're going to make the 7:57, you'd better be going."

The day was long enough in passing, but with its close came Bill. Over Paula's shoulder he could see the birthday candles flickering merrily on that wondrous confection on the sideboard.

"Will you unhand me, villain," she said, "and let me take your pencil for a moment. I must inscribe this little package, and I cannot find even the stub we mark the milk card with."

The villain fished, and then ruefully said: "Here, too. Not a sign of one."

"Then lend me your fountain pen?"

"Fountain pen?" said Bill. "You know I have a fountain pen in years. Never things, anyway."

"Then I must accept with just said Paula.

Willoughby ed the neat packet, id of the gift and th in velvet and shone cylindrical of ar and a Wahl

H stood in h and it ll foreknow the re ula asked:

Bill?"

m!" he ech They're hat I want ly what But just th beautiful the dandy ting tools y man cou How did ome to thin m! You're a —and I'm fo

hich he w til Paula pro- ed against ulder that din- r needed th sonal attention.

Every so uring dinner, his hand stray the presents from Paula, and ard, when he was pretendin id from a book that Barclay him, she saw him balancin or the other of those gifts, s an appreciative glance along aming, engraved barrel, and ng himself with little cluck tisfaction.

"C ill," she said. "You really don ow how nice they are. Let me w you, as the salesman showed me." And perched on the arm of his m ive easy chair, she "demonstrated" the Eversharp, to Bill's infinite delight and, it must be admitted,

***An Eversharp to Match, $5.00***

his education too.

A little tug at the cap, and a plump new eraser offered its service against any slip of the hand—surely, here the easiest way out of an error.

Then see how easy it is to re This little magazine in the top is posed the moment you draw mechanism out of the barrel. L the cap a couple of turns, and tap on the palm of your hand one of these loose leads out, al for use.

Just set the new lead in t of the magazine, slip the bar down over it, turn up the cap a few times—presto! There's your new lead peeping out at the end.

***A Favorite Wahl Pen, $6.00***

Notice, now, how firmly that lead is gripped in the tip—"the Eversharp rifled tip." Nary a wabble. Just straight and true and firm, no matter how long or short the point you use, nor from whatever slant you write.

"Another thing, Bill," said Paula, "and I think this really decided me to get you these for a present: the jeweler told me it was *one of the finest pieces of jewelry design* he knew, done with the jeweler's precision, and manufactured to last a lifetime. There now, have I said too much?"

"You've just made me see more value in your gift, my love," said Bill. "And I want to thank you for the extra thoughtfulness you showed in having my name engraved in the neat little panel along the side. And now, sweet salesman, how about the pen?"

"Oh, the Wahl Pen is a dear! First thing, it holds more ink than that paunchy one you threw away. You wouldn't think so, to see its slim, cylindrical grace. But they proved it to me, right on the Eversharp and Wahl Pen counter at the store. You have more words at your command—less need to refill—and dependability."

Paula had also shown how strong the W The salesman took the threw it on the floor—h break! Then picked it up ed it on—*hard*—no break as exactly the way Willo broken another fountain he appreciated Paula's the demonstration. N that can happen to a Wahl made, like the Eversharp, lifetime—guaranteed.

"A so ma s!" Paul ed. "Ever pen po very style g—fine, coarse, nting, r of them mber of o—Colonial, Grecian, And anyth anted in of precious tals—solid ld-filled, or and a style one of the e price I felt paying."

ll Willough ed to put the versal jud of them into rds, in th letter he wrote ith his W There were several things letter intended for Paula's eyes, but these we can share wit

"This inest pen that I have ever kn is a revelation in what a real pen should be and is. It ha ince that is grateful to every ment and pressure of the han sure I could write with it hour and never feel hand w

oint has exactly the proper ty and firmness. It has a flu- that seems to fit the speed, the mood, with which you drive it. moves with an ease and silence at remind one of something that's electric.

"I never knew such progress had been made in fountain pens! This

***An Eversharp to Match, $5.00***

Wahl Pen is the one I've dreamed about—and here it is, a reality that is a *dream!*"

Copyright, 1925
Avery Edwin
Field

The charm of Southern California lies in its great variety of scenery and strange sights. Above is a glimpse of sand dunes that rival Sahara in weird coloring.

# The Great *Fun* of Southern California

A Springlike climate—away from snow and ice—*plus a great variety of unique diversions.* Bask in this warm sunshine. But have this all-inclusive diversity of pleasures, too, to entertain you.

THE broad stretches of the beaches, the inspiring heights of snow-capped mountain tops, the beauty of an orange grove in bearing, the lure of a gigantic desert resembling Sahara. A great city close by. Campers passing through it, their cars packed with tents, guns and fishing tackle.

And, everywhere, golf courses, tennis courts and polo fields—the outdoors every day.

A strange-looking crew appears in fancy costume—a moving-picture troupe. A little farther down the road, an old Spanish Mission built in 1774.

You have a notion to do this or that today—you jump into a motor car and go and do it—riding, on the way, on a paved boulevard as smooth as a city street—a hundred miles in three hours, and rare scenery on every side.

Fields of flowers, varicolored hills, unusual trees.

A strange enchantment, complete change, absorbing interest, GREAT FUN.

That is Southern California—these are the Southern California *pluses* which are added to the climate to make it *fun* as well as pleasant to be here—the favorite pastimes of *all* men, *all* women and *all children* to make *whole families* happy. Do you know of any other place to equal it?

Hotels, bungalows and boarding houses. Living costs and rates are low. Buy your ticket to Los Angeles and San Diego, returning via Santa Barbara, San Francisco, Portland and Seattle, and *See the Great West in One Trip.*

Ask your nearest railroad ticket agent to tell you more about it, or mail coupon below. Plan it now—the most interesting winter that you've ever spent.

The growth and wealth of Southern California are indicated by the following figures pertaining to the County of Los Angeles alone:

Assessed valuation (1925) $2,910,076,088
Agricultural production (1924), $82,588,993
Bank deposits (1925), more than $1,000,000,000
Oil production (1924), 120,000,000 barrels

## *Southern California*

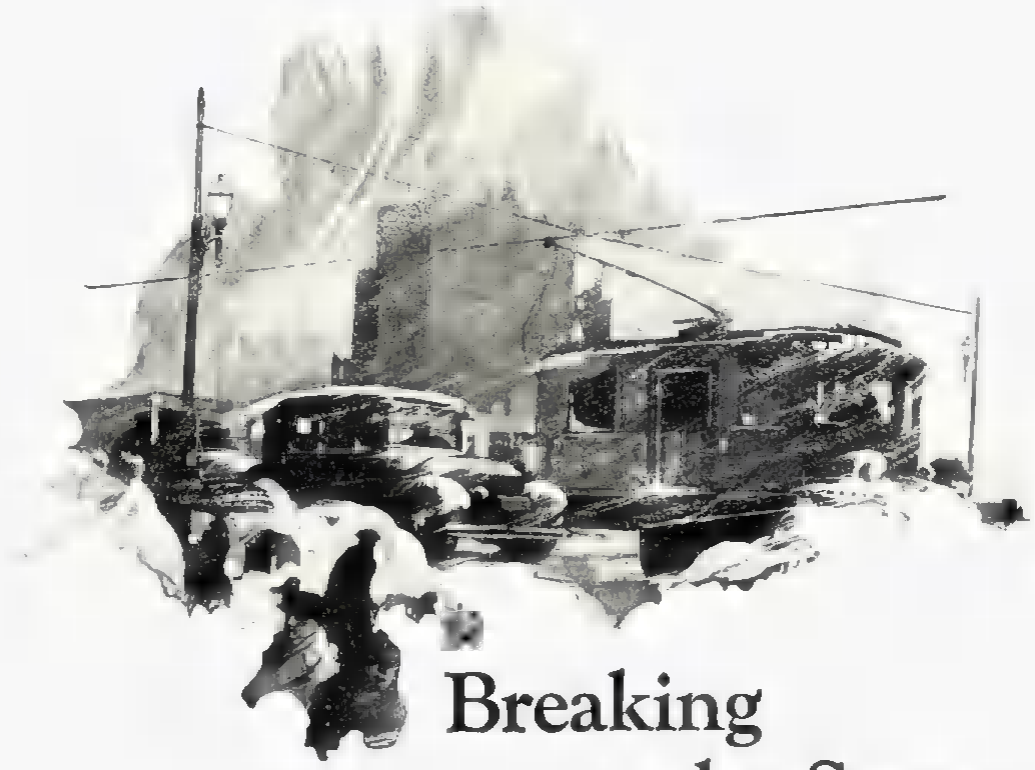
**Year 'Round Vacation Land Supreme**

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA,
Dept. D-11, Chamber of Commerce Bldg., Los Angeles, California.

I am planning to visit Southern California this winter. Please send me your free booklet about Southern California vacations. Also booklets telling especially of the attractions and opportunities in the counties which I have checked.

☐ *Los Angeles* ☐ *San Bernardino*
☐ *Orange* ☐ *Santa Barbara*
☐ *Riverside* ☐ *Ventura*

NAME .....
STREET .....
CITY ..... STATE .....



# Breaking the Storm

The first counter-attack on a blizzard usually comes from big snow plows like this one, which your electric railway company sends down the main highways.

And, in summer, street sweepers and sprinklers take up the work of public service.

Though seldom used, these great electrical machines represent a substantial investment to the company and a real necessity to the community.

You will find this monogram on little motors that run vacuum cleaners, as well as on the 40 h.p. motors of street sweepers and the 400 h.p. motors that handle heavy transcontinental trains. For every service the General Electric Company makes a suitable motor and control.

11-31

# GENERAL ELECTRIC

# She thought her teeth were clean

## Her pride in their beauty was perfectly natural

## *Then an unpleasant discovery*

SHE sat down before her looking glass and placed a little mirror inside her mouth, to look behind her teeth. Horror! At the gum-line she saw a suspicious gray-white deposit. Tartar. Here and there were small dark spots; and the spaces between the teeth had a discolored look.

She must go to her dentist. A brief examination, then the announcement: "Four cavities. A considerable amount of tartar."

"Must be my own fault, I suppose," she asked.

"Why, No," was the answer. "You take better care of your teeth than most of my patients. The trouble is, people don't realize how far they are from really cleansing the parts far back and the spaces between the teeth. Then they are surprised when troubles develop!"

"But how can a person get at such places?" she insisted. "Goodness knows I try hard enough!"

"You'd find a *liquid* cleanser would be a great help," the dentist suggested, "for it will reach the inaccessible places as readily as the visible outer surfaces. Lately, I have been testing such a preparation—the first real dentifrice in liquid form that I ever heard of—not a mere antiseptic wash but an efficient tooth cleanser. If you would use it regularly, you'd soon be aware of the benefit."

That is how she came to use Mu-Sol-Dent.

Discovered at Mellon Institute, University of Pittsburgh, after experts had tried for thirty years to find an "efficient solvent of mucin"—certified as such by this institution—Mu-Sol-Dent cleanses teeth in a new scientific way: It *dissolves* the sticky mucin film from the surfaces of the teeth.

Thus is removed the medium in which decay germs breed and in which are built up tartar crusts, to cause irritation and pyorrhea. Actual, practical experience, borne out by the willing testimonials of 4,000 dentists, shows that Mu-Sol-Dent does thus actually help to prevent decay and tartar.

Mu-Sol-Dent is, moreover, a gargle and mouth wash of unequalled healing qualities. It does the work of a tooth paste, gargle, and antiseptic wash combined, in a safer, easier, more effective way.

***At all leading drug stores. Get a bottle today or use coupon for sample.***

# Mu-Sol-Dent

*"She * * * placed a little mirror inside her mouth, to look behind her teeth." Try it yourself! Look especially behind your lower front teeth. You, too, may be surprised at what you see.*

CERTIFICATE of DISCOVERY
THE MELLON
INSTITUTE of INDUSTRIAL RESEARCH
PITTSBURGH, PA.
Certifies that C. C. VOGT, A.M., Ph.D., an Industrial Fellow at the Institute, discovered and perfected the formula of "MU-SOL-DENT" which is chemically an efficient solvent of mucin plaques.
Mu-Sol-Dent
Dentifrice, Mouth Wash Gargle, Nasal Douche

## *A Liquid!*

**Only a liquid can reach and clean the hidden spaces where trouble starts.**

*Mail with 10c for Postage*

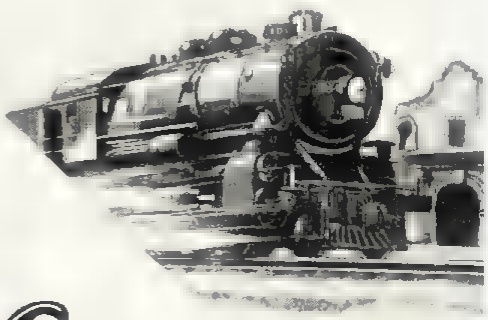
**The V. B. Corporation**
**916-N Forbes St., Pittsburgh, Pa.**

Please send Free Sample Bottle of Mu-Sol-Dent to

Name.....

Address.....

# Sunshine all the way to California



## VIA THE SUNSET LIMITED

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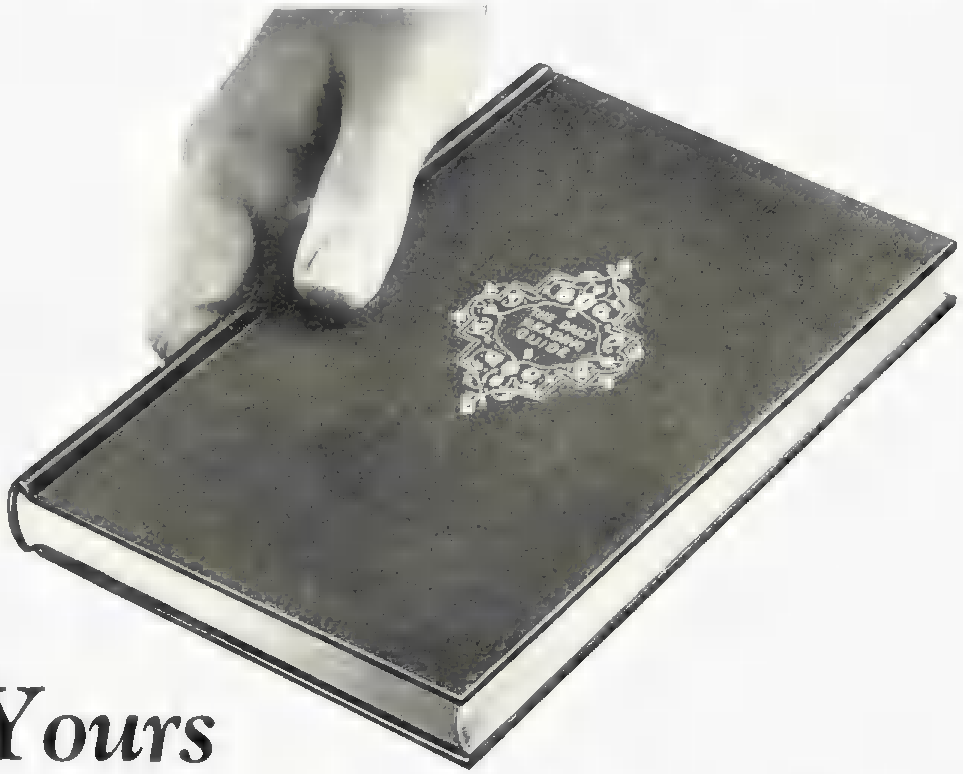

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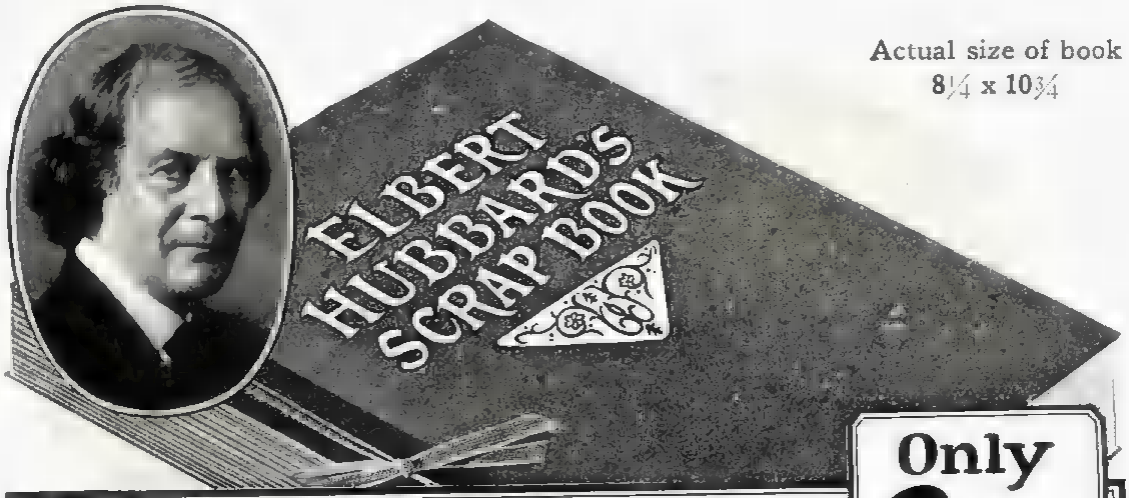


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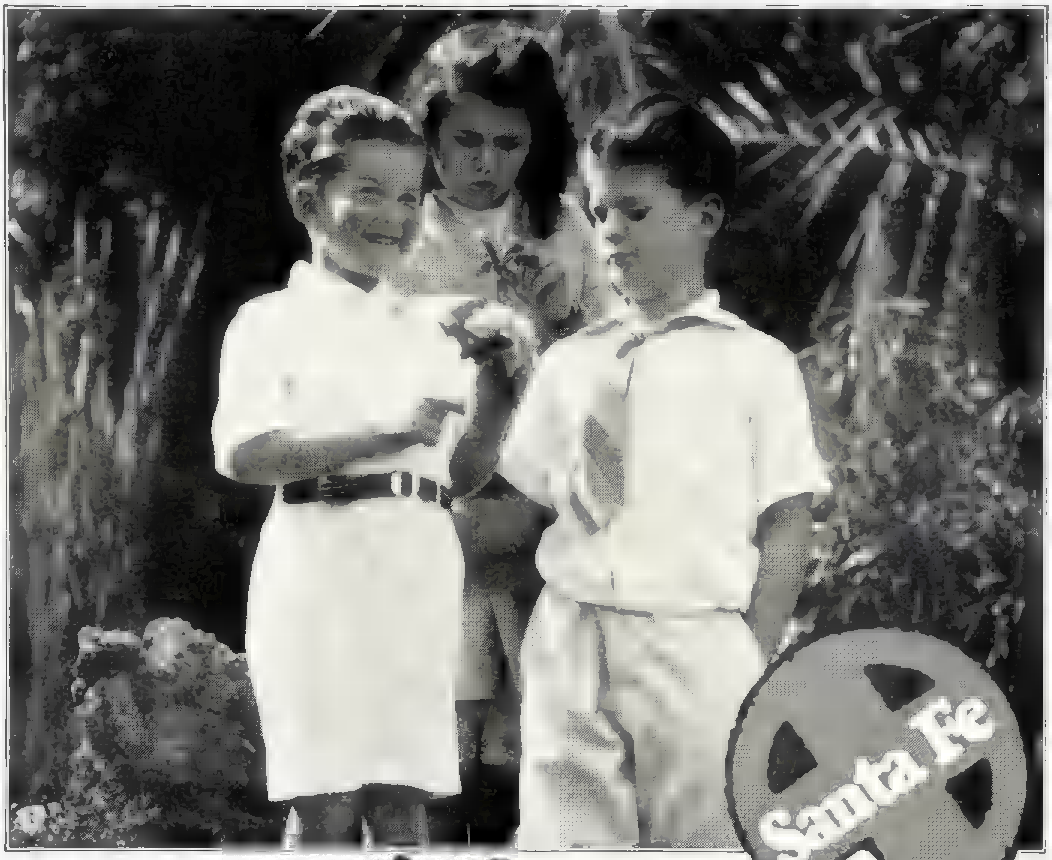


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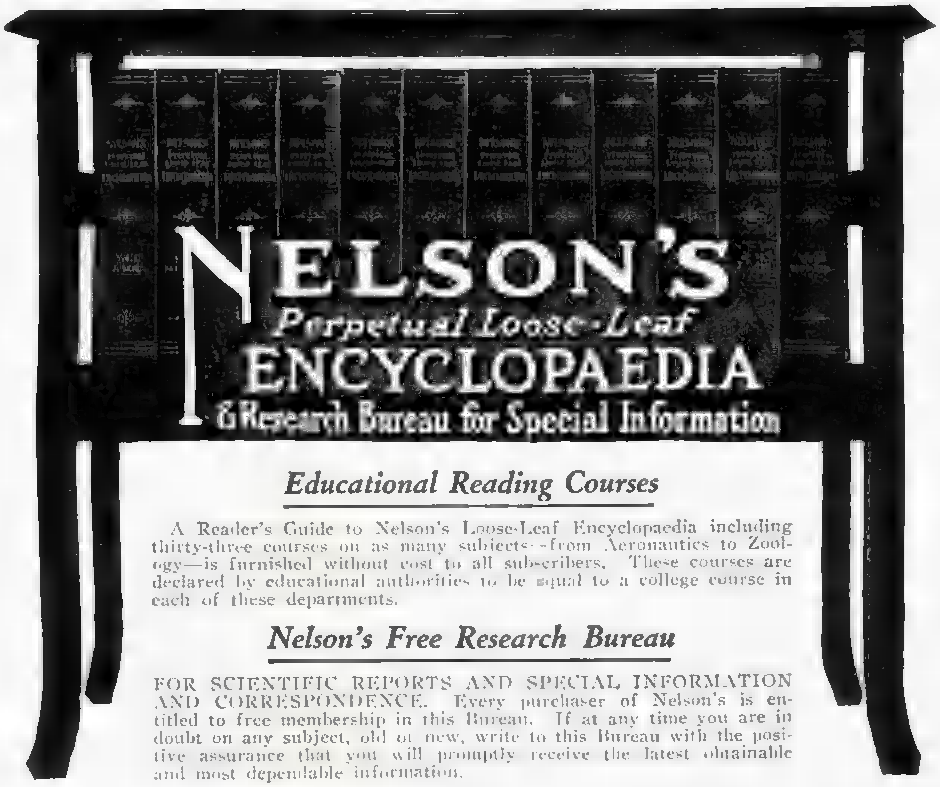


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Breathing is the first necessity of life—yet few of us know how to breathe to develop our bodies and to improve our health. If we could be always in fresh air taking plenty of exercise, our usual undirected, instinctive breathing would naturally develop to give us better health. Nature would take care of us. But the conditions in which we live, the stress of present day life, cause us to accumulate an excess of poisonous waste products in our bodies. To help dispose of these we should go beyond instinctive breathing and at frequent times during the day mentally direct the breaths we take.

**AIR!**

Baby's first cry! However it may sound to grandmother's ears, it is music to the baby's mother. Under the spell of her eager imagination that thin little cry is a call for her. But what he really is crying for is *air*. In the land of Unborn Babies he had no need to use his lungs. But here, in the great wide world, his first need is air and through every moment of his life he will demand air.

### *Count Your Breaths—*

How many breaths a minute do you take? Stop now with your watch in hand and for 60 seconds count them. Fifteen to twenty short, top-of-your-lungs breaths? You are not breathing deeply. Occasionally you should take six or eight long, leisurely breaths a minute—so deep that the diaphragm is expanded and the ribs are barreled out. Several times a day stop what you are doing, stand straight with head up, shoulders back and *breathe*—always through the nose.

Try it this way—inhale, one, two, three, four; hold, five; exhale, six, seven, eight, nine; relax, ten. This will give you six breaths a minute—quiet, unhurried breathing. After a time your unconscious breathing may become deeper and you will begin to feel a new and delightful sense of buoyant power.

Deep breathing exercises should be taken night and morning. Empty the lungs with each breath. This is important because fresh air removes harmful waste matter in the blood.

### *That "Stitch in the side"—*

Have you ever felt a stitch in the side when running? This is a warning—not always that your heart is weak, or that you have indigestion, but sometimes that your lungs are unaccustomed to being filled to their full capacity. One-third of the lung cells of the average person is unused. These cells tend to collapse and stick together. When the air is forced into them, it sometimes causes pain.

Your health demands that you should breathe properly. Without deep breathing of fresh air there cannot be an ample supply of oxygen. Without sufficient oxygen there cannot be adequate growth or repair of any part of the body, nor vigorous warfare against disease.

Begin today to breathe deeply—breathe for health.

About one out of six of the total number of deaths in the United States each year is caused by diseases which affect the lungs. Pulmonary tuberculosis and pneumonia claim more than 210,000 victims annually. Ten years ago the death-rate from tuberculosis was sixty per cent higher than it is today. Only a short time ago it was thought that fresh air must be kept away from patients suffering from lung troubles! Today it is known that fresh air is one of the main aids in getting well—and this knowledge has helped to produce the marked decrease in tuberculosis death-rate.

The Metropolitan Life Insurance Company has prepared a booklet giving simple and interesting health rules, including scientific advice about fresh air and proper breathing. These rules, with the simple breathing exercise given above, can be followed by anybody who wishes better health. Send for a copy of "How to Live Long". It will be mailed free.

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VOL. XLVIII, No. 5 WASHINGTON NOVEMBER, 1925

THE NATIONAL GEOGRAPHIC MAGAZINE

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# THE MACMILLAN ARCTIC EXPEDITION RETURNS

## U. S. Navy Planes Make First Series of Overland Flights in the Arctic and National Geographic Society Staff Obtains Valuable Data and Specimens for Scientific Study

BY DONALD B. MACMILLAN

LEADER OF THE MACMILLAN ARCTIC EXPEDITION, UNDER THE AUSPICES OF THE NATIONAL GEOGRAPHIC SOCIETY, IN COÖPERATION WITH THE UNITED STATES NAVY; AUTHOR OF "PEARY AS A LEADER" AND "THE 'BOWDOIN' IN NORTH GREENLAND," IN THE NATIONAL GEOGRAPHIC MAGAZINE

IT is natural for man to wonder what lies beyond the mountain peaks, what strange and interesting things may be below the encircling horizon. Without this incentive there can be but little progress.

True, dreams of untold wealth, of Eldoradoes, of waters potent with eternal life, of lotus lands free from care, of a life of happiness, have all driven men on into the unknown; but man's inborn desire to seek, to know, has been the dominant factor in the exploration of the world, no section of which has proved more attractive than the North, with its far-stretching, grinding ice fields, its eternal, snowcapped peaks, its encircling sun and stars, its strange forms of animal life, and its swarthy, square-faced aborigines.

Man's ingenuity has devised many a scheme for the exploration of this great unknown area. Staunch ships have been built and crushed. Man has harnessed himself to his sledge and plodded slowly, painfully on. Sails and even gigantic kites have been utilized in this arduous toil. Siberian ponies, burros, reindeer, dogs, balloons, and motor sledges have all played their part—some successfully. Thus far the dog remains king.

With the marvelous development of airplanes and their noteworthy feat of encircling the world, naturally such means would be considered for conquering the North, especially during the summer months, when the temperature, being well above the freezing point of fresh water, is one of the least factors to be considered in the proper functioning of the gas engine. Given proper *landing places* and *time*, nothing can militate against eventual success, provided engines are fairly reliable.

### THE GREAT MYSTERY OF THE POLAR SEA

One great area in the Polar Sea remains a mystery—roughly, that between Alaska and the Pole and northwest of Axel Heiberg Island. Here at least twice land has been reported and here tidal experts have predicted that it would be

Photograph by Jacob Gayer

BATTLE ISLAND AND BATTLE HARBOR FROM THE HEIGHTS OF GREAT CARIBOU, LABRADOR

The *Bowdoin* lies at the dock, taking on fuel oil for its long run to Etah and return. The white buildings are connected with the fishing industry and general trading. Jutting out behind the general store, in the center, is one of the hospitals of Dr. Grenfell. Against the skyline can be seen the aërial of the northernmost year-round radio station on the east coast of America. Inland from the *Bowdoin* can be seen a corner of the extensive fish-drying platforms. Battle Island is the legendary scene of early fighting between Eskimos and Indians and is the concert platform for the loudest "husky" dog chorus in the world.

found. The quest for this land was the primary object of the so-called Crocker Land Expedition of 1913-17. Inaccessible by ship and extremely difficult to reach with dogs, it awaits exploration by air.

The rough ice of the Polar Sea, thrown into hummocks and pressure ridges by strong winds and currents, precludes the possibility of safe emergency landings. Such exist, however, and can be found in the early spring months, before the warm summer sun thaws the covering of wind-packed snow and reveals a hard, blue, rolling surface interspersed with pools of water of varying depths.

Since no one has ever visited this section during the summer months, no data are available for determining the relative amount of open water. From my own experience and that of Peary and Nansen, it is reasonable to infer that the "leads" increase in size and number as the season advances. Therefore one's chief dependence should be upon a water plane. However, conditions demanded that a plane might be called upon to take off from and alight upon land, ice, or water. The Loening Amphibian has these requisite qualifications; hence our choice of this particular type.

Etah, North Greenland, eleven and a half degrees from the Pole, is the ultimate port in Smith Sound which a ship can safely visit and leave the same season; therefore my choice of this well-known place as headquarters.

## THE ORGANIZATION OF THE 1925 EXPEDITION

The National Geographic Society, ever progressive, ever interested in Arctic study, and ever ready to sponsor plans having as their object the exploration of

Photograph by Jacob Gayer

THE "BOWDOIN" STANDS BY WHEN THE "PEARY" GOES AGROUND NEAR HOPEDALE, OFF THE LABRADOR COAST

Later, the *Peary* repaid the debt by bucking a way through the dread Melville Bay ice-pack on the way north and by coming to the aid of the *Bowdoin* when she went on the rocks off Redcliffe Peninsula on the return trip (see text, page 513, and illustration, page 504).

the unknown and the diffusion of geographic knowledge, financed my expedition of 1925 from funds provided by its million members, and encouraged me in every possible way to bring back worthy results.

Four men were detailed as assistants: Lieutenant Benjamin H. Rigg, of the U. S. Coast and Geodetic Survey, as magnetic and tidal observer; Dr. Walter N. Koelz, of the U. S. Bureau of Fisheries and the University of Michigan, as naturalist; and Mr. Maynard Owen Williams and Mr. Jacob Gayer as staff correspondent and color photographer, respectively, of the National Geographic Society.

The United States Navy generously cooperated with The Society in the furtherance of my plans by sending a separate unit of eight men and three amphibian planes for the work on the Polar Sea. These men and this branch of the work were under the command of Lieutenant Commander Richard E. Byrd, Jr., of the Bureau of Aëronautics. Since I was merely a passenger on the planes, traveling with his permission, credit should be given to him for what the planes really did. (See pages 519 to 532, inclusive.)

Photograph by Jacob Gayer

THE "PEARY" IN HARBOR BEHIND BATTLE ISLAND, LABRADOR

Along the Labrador coast the many islands offshore provide good "inside runs" and adequate harbors. When the straits are so narrow that navigating them is "ticklish work," they are called tickles, and on the trip "down north" both the *Bowdoin* and the *Peary* threaded dangerous passages rather than put out into gales which might sweep the planes from the deck of the latter, which carried the Navy personnel.

Photograph by Jacob Gayer

MIDNIGHT SAILING INTO THE HOME OF THE ICEBERGS

This splendid arched berg was encountered just at midnight on July 30–31. The *Bowdoin's* 60-foot masts are quite dwarfed beside the ice mass, seven-eighths of which is below the water. Within a few hours after this photograph was made the fog was so dense that one could scarcely see the length of the ship, and further cruising among the bergs of upper Baffin Bay was suspended until morning brought a clearer sky.

Photograph by Jacob Gayer

SAM BROMFIELD BROADCASTS ENTERTAINMENT FROM THE LABRADOR WILD

British subject, proud of his king; father of Abram, proud of his son; lover of merriment, proud of his skill, the "Mayor of Jack Lane Bay" plays his fiddle for an invisible audience half a continent away.

In contrast to the lone, silent months that Peary, Greely, and other explorers spent in the Arctic with no word from home, was our experience of hearing the voices of our friends, and concerts from our home cities, by radio.

For the transmission of our day-to-day messages, through the National Geograpic Society and the Navy Department, we also depended upon our radio and the fine, unselfish, and unflagging coöperation of the code radio operators who are members of the American Radio Relay League.

Press associations and newspapers coöperated in this news transmission which, in itself, was of value to the science of radio, and which demanded constant resourcefulness at the receiving end, because we never could be sure that we would send by the same operator on two successive nights. It was the amateurs who relayed the messages to be distributed at Washington and made it possible for members of the National Geographic Society and all readers of newspapers to follow our day-by-day movements.

E. F. McDonald, Jr., was in general charge of radio; equipment furnished by the Zenith laboratories was used, and my own operator aboard the *Bowdoin* was John L. Reinartz, known to amateurs the world over, while the *Peary's* dispatches were ably handled by Paul J. McGee and Harold E. Gray.

TWO SHIPS OF THE EXPEDITION SAILED NORTHWARD ON JUNE 20

The steamship *Peary*, with my second in command, E. F. McDonald, Jr., carrying the Naval unit and the three planes, was given a rousing send-off from the Charlestown Navy Yard on Bunker Hill Day and joined the *Bowdoin* at Wiscasset, Maine, from which port both ships sailed on June 20 for Sydney, Cape Breton Island, Nova Scotia, to take on the last supplies of coal and fuel oil.

A few necessary changes on the *Peary* were effected at Sydney. Portholes were covered with steel plates, the better to resist ice pressure in dread Melville Bay.

Photograph by Jacob Gayer

GREENLAND GIRLS OF UMANAK

The south Greenland population contains little Eskimo blood, and the people are called Greenlanders irrespective of the proportions of their racial make-up. The costume is distinguished for its bright bead collar and fine boots, but the most colorful bit is the thigh panel on the tight sealskin trousers. Inside a border of shiny red there is a strip of white from a reindeer breast, and the inner section is a polychrome mosaic composed of hundreds of tiny bits of leather sewn to the background. The old style of combing the hair has given way to ugly knitted caps.

Photograph by Jacob Gayer

A JULY DAY AT UMANAK, WHERE THE "PEARY" COALED

The glacier at the head of Umanak Fiord sometimes advances 50 feet a day, and casts off so many bergs that the water is never free of ice. The coal mines are about 14 miles away from this unusually prosperous little settlement on the north edge of the Nugsuak Peninsula, north of Disko Island and Disko Bay, where Peary began his Arctic work.

Photograph by Maynard Owen Williams

PANDORA HARBOR AND CAPE KENRICK FROM CRYSTAL PALACE CLIFFS

This quiet harbor, just north of Cape Alexander, was the anchoring place of Sir Allen Young's ship *Pandora* in 1876. Off its mouth herds of walrus are frequently seen and the hills are full of snow-white Arctic hares. In the distance are the snow hills of Ellesmere Island. Etah is about eight miles away to the north, off the right side of the picture. In the right foreground is the *Bowdoin*.

Photograph by Maynard Owen Williams

WHEN FOG AND PACK ICE HALTED THE SHIPS ON THEIR NORTHWARD PUSH THROUGH MELVILLE BAY

Three days from Etah the *Bowdoin* and the *Peary* encountered fog, which made ice pilotage impossible. The situation looked gloomy. Commander MacMillan decided that a diversion was necessary, so a snowball fight was staged by both crews, after which Chief Aërographer Francis dived into the waters of Melville Bay.

The delay caused by this work and the refilling of the bunkers resulted in the *Bowdoin* proceeding to Battle Harbor, Labrador, a few days in advance. Here the *Peary* rejoined us on July 2, both ships going north on the 5th to Domino Run, where we purchased a supply of native sealskin boots, much lighter and warmer for northern work than our homemade product.

Five miles east of Cape Harrison both ships met the ice-pack lying close against the land and extending north in an almost unbroken sheet.

This was the *Peary's* first encounter with the pack. It is generally conceded by experienced men that an iron ship is not the equal of a wooden ship for northern work. When bucking ice, rivets are easily started; when sailing in uncharted waters, grounding is imminent at any moment; and steel hulls are easily punctured by sharp rocks. There are no dry docks in the North except the beach, which a deep-draft ship cannot reach. A steel hull cannot be compressed without serious injury. A wooden hull will spring back into shape.

The *Peary*, with her 600-horsepower triple expansion engines, her 9-foot propeller, and her triple-plated bow, nosed her way through the ice as if this were mere play. I was relieved of all anxiety about her ice-bucking ability.

Before us lay possibly the most difficult bit of navigation of the whole trip—the inside run from Cape Mokkovik to the Moravian settlement at Hopedale. The most able captain could never navigate this by chart. On the Labrador coast, north of Hamilton Inlet, experience is the only guide.

With one eye over our bow and the other back over my shoulder at the flaring bow of the *Peary*, close behind, I directed the *Bowdoin* over the path she knew so well.

When approaching Flagstaff Tickle,

Photograph by Jacob Gayer

THE LEADER OF THE EXPEDITION WELCOMED BY SMITH SOUND ESKIMOS

Just south of Conical Rock the *Bowdoin* was greeted with the sound of guns, and two Eskimos dashed out from the shore in their kayaks to welcome the members of the Expedition. They are here seen receiving gifts of tobacco, one of the few things for which the Eskimo must depend upon the outside world (see text, page 500).

nine miles from Hopedale, the course lies near a breaking ledge so close on the starboard that Captain Steele of the *Peary* was a bit overcautious. I was on the point of waving him in, when up shot the bow of the *Peary* and over she went on her side. We whirled the *Bowdoin* hard-a-starboard and within a few minutes were alongside the *Peary* (see page 479).

Always when a ship grounds the all-important question is: "Is the tide running or falling?" To our relief, it was rising, and it was only a matter of time until the *Peary* would be afloat. But, since pounding upon the rocks would certainly result in injury to the hull, it behooved us to do everything possible to get her off at once.

Captain Steele, with his practical knowledge of the sea, suggested that the *Bowdoin* pull the *Peary* off by the masthead, a well-known method of decreasing the draft of a ship. Our attempt to do this resulted in pulling the *Peary* over from her list to port to a heavy list to starboard and in snapping our hawser. We then ran out kedge anchors from stern and bow and picked up Captain Steele and three of his crew in a small boat, who were vainly endeavoring in a rough sea to run out another hawser.

In the meantime some of the men on

Photograph by Maynard Owen Williams

ROLLING A WALRUS ONTO A ROCK BEACH AT LOW TIDE

In winter the Eskimos are skillful in hauling their walrus trophies onto the ice, but in summer they capture specimens too heavy to drag ashore. They bring their catch as near to land as possible, and then make the receding waters provide them with a dry dock.

Photograph by Jacob Gayer

WHERE AN ADVANCING GLACIER BECOMES A SHRINKING LAKE

Within the memory of living men John's Glacier, which terminates Foulke Fiord, ended at least half a mile back of Alida Lake. To-day it drops away into the lake itself.

Photograph by Jacob Gayer

THE EXPEDITION NATURALIST SKINS BIRDS ON THE DECK OF THE "PEARY"

Lacking adequate storage space for his specimens, Dr. Koelz spread out his drying skins on his bunk, while he slept on deck. Each specimen had to be properly ticketed and no egg was taken unless the mother bird could be secured.

Photograph by Maynard Owen Williams

POSING FOR THE NAVY'S AËROGRAPHER AND MOTION-PICTURE PHOTOGRAPHER

This future hunter among the Smith Sound Eskimos shows how acceptable a ten-cent mouth organ can be to a regular boy who had never seen or heard one.

Photographs by Jacob Gayer

THE MACHINE WITH WHICH THE TIDES AT ETAH SIGNED THEIR FIRST AUTOGRAPH

Lieutenant Benjamin H. Rigg carried with him to Etah an automatic tide gauge which recorded every move of the sea. Because of an unusual tidal range, the piping taken to the Arctic was not long enough and an extension had to be made of boards from airplane crates.

AK-KOM-A-DING-WA WATCHES LIEUTENANT RIGG AT HIS SCIENTIFIC WORK IN ETAH

Over the tent flies the flag of the United States Coast and Geodetic Survey, under which Rigg has worked on our South Atlantic coast, off Alaska, and in the Sulu Sea. The magnetic force at Etah is only one-tenth as strong as at New York, so compass readings require great care.

Photographs by Maynard Owen Williams

NOO-KA-PING-WA AND HIS HARPOON TROPHY

In capturing this walrus head there was plenty of excitement for all. At least a hundred walrus were in the herd which gave battle to the Expedition hunters. One kayak was overturned, two bladder floats were punctured by enraged walrus bulls, and the herd was kept at bay by rapid fire from high-power rifles. Three walrus were dragged in for meat and museum specimens.

REINARTZ, AT ETAH, LISTENS IN ON THE WORLD

Much of the success of the Expedition's radio work depended upon the eager coöperation of Reinartz's associates of the American Radio Relay League in transmitting messages. More than 30,000 words of news dispatches alone were sent out from the *Bowdoin* addressed to the National Geographic Society and released by it, day and night, to the press associations (see text, page 482).

ESKIMO WOMEN ON THE "PEARY" LISTEN IN

Photographs by Jacob Gayer

PRIMITIVE MAN ESTABLISHES CONTACT WITH HIS FELLOWS ABROAD

In-you-gee-to, one of Peary's men, sings an Eskimo song for the nation for whose representatives he considers no feat impossible. Commander MacMillan introduced the phonograph, the telephone, the movie, and many other modern inventions to his Eskimo friends; but as for wireless, why should it not be more simple to talk without wires than go to all the trouble of stringing them? The photograph shows the dining saloon of the *Peary*.

the *Peary* were packing bags preparatory to leaving the ship. Many interesting and amusing incidents happened during the excitement.

Captain Steele, starting his steam winch, soon had his hawser tight as a fiddle string. With the rising water, the *Peary* swung from the rock and rode to her kedge, a few yards from the breaking reef.

Instructing Captain Steele to keep directly behind us, we threaded Flagstaff Tickle, passing two bad underwater rocks, where many a Newfoundland fishing schooner has been wrecked.

Upon reaching Hopedale we found the Mission flag snapping in the breeze to give us welcome.

It would take many issues of the NATIONAL GEOGRAPHIC MAGAZINE to give its readers an adequate idea of what these brave and unselfish Moravian missionaries have been doing on the bleak Labrador coast for the last 154 years! Were it not for the Moravians, there would not be a single living Eskimo on that coast to-day. From the time that Jensen, standing with outstretched hands in the bow of a boat, called, "I am your friend!" life has been safe for Eskimos there.

Eskimo history is the history of all savages, slowly retreating from the outposts of civilization and dying from its diseases. Once a great race, extending to the northern shores of the Gulf of St. Lawrence, they are not to be found to-day until one reaches the half-breed at Mokkovik, 55° 14′ N.

The strenuous fight of the Moravians has been waged not so much against the ignorance, superstition, evil practices, and primitive religion of the savage as against the sins of the so-called civilized.

Photograph by E. E. Reber

AK-KOM-A-DING-WA, CONFRONTED WITH AN ELECTRIC FAN IN THE ARCTIC, SEES THE JOKE

But he did not appreciate the use of this unusual bit of Arctic equipment. The National Geographic Society photographers, in their effort to record the delicate tints of the North, were forced to dry their plates quickly to avoid spottiness (see text, page 515).

### ESKIMO WOMEN OUTFIT EXPEDITION WITH SEALSKIN COATS

The crews of both our ships fairly mobbed the Mission store in their eagerness to secure the light, water-tight seal-

Photograph by Maynard Owen Williams

THE ESKIMO WOMAN'S CHIEF TASK: REPAIRING FOOTWEAR

In a region where death from exposure is a constant threat during much of the year, the work of woman has evolved into that of seamstress. Koo-e-tig-e-to's wife here shows how a skin stocking is made. Since the jaw gives the firmest possible grip, it is much used in shaping the Eskimo footwear.

Photograph by Maynard Owen Williams

ME-TIK, WHOSE NAME MEANS EIDER DUCK, SHOWS HOW TO EAT RAW MEAT

The flesh of birds is much esteemed by the Smith Sound Eskimo, who has few worries over a balanced diet and who never suffers from scurvy. Rheumatism, ascribed by some to the all-meat diet, is common.

skin native boot. Two days of busy sewing by the native women fitted out many of the crew with blanket "dickies" and sealskin coats.

On July 10 we were away at 1:30 a. m., threading our way through the narrow Dark Tickle, on past hidden rocks to Windy Tickle, where we anchored to give me an opportunity to run up in the powerboat for my old interpreter, Abram Bromfield, who had accompanied me on two previous trips.

On our return to the *Bowdoin*, preparations were made for the immediate departure of both ships for Greenland. When the anchor was on the bow, I rang the telegraph "Full speed ahead!"

With amazement I noted the engine turning rapidly, but not an inch of headway. For the first time in my service, the *Bowdoin* refused to move. Had we broken our shaft? Had we lost our propeller? I peered into the water under our counter and saw the propeller still in place, but absolutely dead.

After calling to the *Peary* to go on, and promising to rejoin her in Greenland, a more thorough examination was made.

### A NEW PROPELLER FITTED TO THE "BOWDOIN"

The *Bowdoin*, with her 10-foot draft, was designed to equal the rise and fall of Arctic tides with a view to beaching her, when necessary, for repairs, but our accident happened at one place in Labrador where there is a rise of only four feet at neap and seven maximum at spring tides. We needed at least eight.

We were in a serious predicament. The *Peary* could not do the summer's work alone. She had gone on with the planes and aviators, but the *Bowdoin* carried spare parts, three Liberty engines, and 1,500 gallons of gas. There was only one thing to do—return to Hopedale,

COMMANDER MACMILLAN WITH ONE OF HIS YOUNG ESKIMO FRIENDS AT ETAH

Photographs by Maynard Owen Williams

IN-YOU-GEE-TO READY TO FEED THE RAVENOUS DOGS OF ONE OF HIS SLEDGE TEAMS

Those whose dependence has been on the Eskimo dog have infinite faith in its powers and usefulness. Engine or fuel, as the conditions require, the husky begins life as the playmate of the children and often ends it in saving the life of his master. Always hungry, often savage, the Eskimo dog still has qualities which endear him to all his friends.

where there were higher tides and plenty of Eskimo help and equipment. Our trip back, towed by the Bromfield motorboat, was a painfully slow 25 miles.

Now began a tedious delay for a greater tidal range and a struggle to lift the stern of the *Bowdoin* sufficiently high to substitute our spare propeller. This was finally accomplished in five days by shifting all heavy weights to the bow and placing eight empty casks under the stern. Even then the men were compelled to work in ice-cold water and amid swarms of ravenous mosquitoes!

With interest we examined our old propeller, now upon deck. The cause of the injury was apparent. When endeavoring to salvage the *Peary* lifeboat at the time of her grounding, we had wound a rope so tightly around our main shaft just abaft of the stuffing box that the patent gears of our self-feathering propeller had actually burst the hub.

Photograph by Maynard Owen Williams

IMPROMPTU ESKIMO ART ON ONE OF GREENLAND'S RARE SAND BEACHES: IGLOODAHOUNY

At Etah new ice had formed on the harbor. At this spot on Robertson Bay, only 50 miles farther south, there were footprints of bare feet, showing where the Eskimo children had been at play. It is hard to distinguish between the Eskimo men and women, since the costume is much the same, but the hourglass or lamp-chimney hair dressing of the figure (head down) on the left shows that it represents a woman. The *Bowdoin* is anchored in waters made smooth by the iceberg barrier reefs at the mouth of Robertson Bay. In the distance is Herbert Island, near whose shores in 1909 Peary, the Pole conqueror, helped his Eskimos hunt winter food before he dashed homeward with the glad news of his discovery.

We were away on the 19th at full speed to rejoin the *Peary*, anxiously awaiting us at Godhavn, Disko Island. Early on the morning of the 24th, after a fine run up the spectacular Greenland coast, we shot around our sister ship and dropped anchor in front of the Governor's house. We were together again.

The *Peary* is a coal burner, and before leaving home I had made arrangements for fuel at some Greenland port, but the Danish officials declared that no coal could be spared at Godhavn. Through wireless communication with Washington, however, the good offices of the Danish Minister, Hon. Constantin Brun, were enlisted and by the time the *Bowdoin*

Photograph by Maynard Owen Williams

WHAT A GEOGRAPHIC PHOTOGRAPHER FOUND IN OO-BLOO-YAH'S TUPIK

Nothing pleased the Eskimos more than the pictures of their people as printed in the National Geographic Magazine for June, 1925 (see, also, illustration, page 510), and a copy of this number is here seen amid the clutter of presents and household utensils. Teapot, comb, matches, wooden beads, A B C book, and knitted cap—it is evident that the explorer, bringing gifts, has modified the life of the primitive folk of Igloodahoury.

arrived coal had been promised at Umanak, as much as we could possibly load on the ship. Governor Rosendahl, of Godhavn, volunteered to accompany the *Peary* to the coal depot, 180 miles north, personally to superintend the loading of the coal.

### A SEAL HUNT ON THE PACK ICE

As both ships proceeded northward we encountered our first ice off South Upernivik, a scattered field, through which we easily passed. A half hour later we met the real pack—hard blue ice five feet thick. We were glad to follow the *Peary*, slowly smashing through it with her reenforced steel-concrete bow.

Finally conditions were such that we tied up to a large sheet to await better luck. When I awoke from an hour's sleep, I found the field dotted with hunters and photographers.

Within a few minutes Rawson came running over the ice, shouting that Bromfield had killed a seal and wanted his harpoon. The seal, our first fresh meat, was quickly secured and brought on board.

With a change of tide the leads began to open up. We blew the *Peary's* steam whistle to recall our men, all of whom responded except Salmon, who was caught on the far side of a wide crack, which he crossed subsequently with difficulty.

We fought the pack all day, the *Bowdoin* generally following the more powerful *Peary*, which split big pans wide open. When dealing with the solid, unbroken pack ice, the *Bowdoin* was far inferior to her big sister, but in loosely packed ice, in narrow leads with sharp turns, the *Bowdoin* left the *Peary* almost hull down.

At 6 o'clock we were free of the ice and stopped our engines for 45 minutes to await the *Peary*. At 11:30 we were again in the midst of it, slowly working westward toward Cape York.

On July 29 little progress was made. We did not know which way to turn, since a thick fog prevented intelligent ice

pilotage. Fresh bear tracks kept the boys interested and a bit excited over the prospect of fine rugs for their dens.

The 30th was a hard day for both ships. The *Bowdoin* was so tightly wedged that the *Peary* was called upon to extricate her from the jaws of huge ice pans.

As it happened, I spent the day conning the *Peary* through the ice, and therefore had a good opportunity to witness the *Bowdoin* in action—a wonderful sight. Like a thing alive, she twisted and turned through the leads, and when meeting a floe which she could not avoid, fairly leaped out of the water, her clean-cut bow shooting up to such an angle that it seemed as if she were coming out bodily on top of the ice.

Photograph by Maynard Owen Williams

THE EXPEDITION NATURALIST SUGGESTS LOOSER STYLES IN TROUSERS

The wife of Oo-bloo-yah marvels at the size of American men and wonders how she can alter a pair of bearskin trousers to fit one of the Expedition's slenderest members. Both the Eskimo and his wife are thin-hipped, and their trousers are altogether too small for adult Americans. Her tailoring duties do not interrupt this woman's afternoon smoke.

### CAUGHT IN THE PACK

Finally the *Peary*, strong as she is, was absolutely helpless. Four times she had hurled herself at full speed into a crack between two tremendous pans, hoping so to shatter the edges that she might squeeze through. The *Bowdoin* circled about in a narrow basin, jockeying for a dash at the rift made by the bigger ship the instant the latter cleared the narrow opening. The last time, the *Peary* became so tightly wedged that her 9-foot, 4-bladed propeller failed to back her out. We stopped engines, put out ice anchors, and awaited a change of wind and tide. Our best was not enough.

The Arctic is full of surprises, the biggest of which is the sudden change in ice conditions. To the novice our case appeared hopeless and our date of arrival at Etah seemed a long way off. At 4 p. m. we were held tight. At 10 the *Peary* started through the lead without the help of the engine!

So rapidly was she moving that we ran a towline to the *Bowdoin*, snuggling under the red, white, and blue tails of the planes, as if afraid of being left behind.

Photograph by Maynard Owen Williams

AN ESKIMO YOUNGSTER SHOWS EVIDENCE THAT THE SEA HAS ITS UNICORNS

The chief game of the men of Igloodahoumy is the narwhal, or sea unicorn, and beside each tupik were found several spiraled tusks which the Expedition members eagerly sought as souvenirs. It is not unusual to find narwhal tusks 10 feet in length and thicker at the base than baseball bats.

At five the next morning we were again underway, breaking out through the pack into open water and heading straight to Cape York, the hard-fought goal at the end of the Melville Bay ice field.

There most of our men saw their first polar bear not in captivity. She ambled along over the ice fields, just out of rifle range, on a course parallel to that of the *Peary*. To our surprise, she turned toward us, and plunged into open water almost under the bows of the ship. A fine shot by McDonald gave us a specimen for the Provincetown Museum.

Cape York was blocked with ice and clearly inaccessible. We reluctantly passed it by, for here we always receive the first news of the Smith Sound Eskimos.

A broken field extended northward in under the Crimson Cliffs. While we were working through it, two rifle shots were heard and two kayaks were seen paddling toward us from three tents on the beach. The visitors were Tung-we, an old-time assistant of Peary's, and young Mamo-na.

"Tobacco!" was the cry, as it always is during the summer months, when these natives are cut off from the trading station, Thule, at North Star Bay. We stopped our engines, supplied their wants, and hastened on (see page 487).

Shortly after passing Conical Rock we encountered a fog so dense that we narrowly missed several large bergs looming mountainlike in the mist. The *Peary*, being longer, does not respond as quickly to her helm as the *Bowdoin*. She was therefore in greater danger of collision. A radio request from Captain Steele that we lay to for a while was readily complied with, since the compasses on both ships were extremely sluggish and at times varied by 20 and 30 degrees.

### THE EXPEDITION REACHES ITS BASE AT ETAH

The fog soon lifted, and we hastened on to Etah, where we arrived in a snowstorm, three hours ahead of schedule, on August 1.

My plans were for the arrival on this date and for the departure about August 25, but not later than September 1. Since the crews of our ships numbered 39 men and we were only provisioned for three

Photograph by Maynard Owen Williams

MOTHER AND INFANT IN THE CLOTHING WHICH COMBATS ARCTIC COLD

The first essential of Eskimo dress is that it must be practical, for storms are frequent and the nomad life precludes a large wardrobe. The sealskin blouse, with the hood in which the baby is carried, serves to keep out the rain and snow. An underblouse of eider-duck breast-skins furnishes warmth. The short trousers are of fox skin and the long, frost-bleached sealskin boots are waterproof. Woman's chief duty in the North is to provide the clothing which will protect her family from the cold (see, also, illustration, page 494).

Photograph by Maynard Owen Williams

SIP-SOO'S DAUGHTER IN FRONT OF HER SUMMER HOME AT IGLOODAHOUNY

On a grassy slope, whence one can look across an arm of Robertson Bay to Herbert and Northumberland Islands, one of Peary's men has set up his tupik, the sealskin tent which serves the Eskimo for a summer home. Here Sip-soo's youngest daughter is seen with a draft animal of the future, already a pet.

months, an enforced wintering in the North, by one or both, would be a serious matter.

Our work of landing and assembling planes, of establishing food and fuel stations on Ellesmere Island, and of flying at least 2,000 miles must all be done within this allotted time. Every minute must show something accomplished.

My men on the *Bowdoin* at once began work on the landing beach, removing all stones and bowlders and smoothing it up until it was acceptable to Commander Byrd and his men. The sides of the wing boxes were utilized as runways by weighting them with rocks (see page 522).

PLANES READY TO FLY IN THREE DAYS

On August 3 the *N.A.-2* was ready for flight — remarkably quick work by the mechanicians, a picked body of skillful men. The *N.A.-3* and *N.A.-1* followed quickly, in spite of unfavorable weather conditions. On the 4th all planes were in the air, and at nightfall, piloted by Lieutenant M. A. Schur in *N.A.-2*, we made the first flight over Greenland. But the engines were not running satisfactorily. Minor troubles developed in all of them.

On the 6th two planes were loaded to the limit with gas and supplies, with the intention of establishing a substation across Smith Sound. They failed to get off the water. Rain, fog, and low-lying clouds did their worst. It was decided to put a new engine in the *N.A.-1*. Indeed, within 10 days all three had new engines and all had been refitted with new propellers.

Fog, rain, and wind precluded all possibility of flight on the 7th. On the 8th two Eskimos came walking over the stony hills from Anoritok, 19 miles away, to see the giant birds of the white men. They had heard the roar of the Liberty engines and had seen the black dots in the sky. With deep interest they scrutinized every detail of what they had heard so much about.

That evening we left for Cannon Fiord, on the western side of Ellesmere Island, hoping to establish a substation which might help us to Cape Thomas Hubbard, distant in an air line 250 miles.*

Smith Sound was practically covered with large sheets or pans drifting out of Kane Basin, the surface of which was of such a character that a safe landing was impossible, either with wheels or skids. Narrow lanes of open water (leads) offered possible landing places in case of emergency. But, once down, there would be no way of rising out of these leads until they had widened in lower Smith Sound.

At an altitude of 3,000 feet, we passed directly over Peary's winter quarters at Payer Harbor, and a few minutes later over the bowlder to which I had bolted, in the summer of 1924, the National Geographic Society's tablet to the memory of the Americans of the Greely Expedition who died here in the spring of 1884.

There it stands, as a silent tribute, through the darkness and storms of the great night and the long sunlit Arctic day, to the bravery and loyalty of the men who here gave their lives for the advancement of science.

Open water was visible all along the north side of the shore to the west of Cape Sabine. Buchanan Bay and Kane Basin, as far as the eye could see, were practically a solid sheet of ice, with the exception of a narrow lead alongshore on the south side of the Bache Peninsula.

A GEOGRAPHIC PHOTOGRAPHER WITH HIS HANDS FULL

One of the little girls in her bright bead collar was afraid the camera might "go off," so the camera man submitted to the ordeal along with the rest. The gateway here seen is made of whalebone and frames a view from the home of the Governor of Holstensborg.

FLYING OVER A TRAIL LABORIOUSLY FOLLOWED WITH DOG SLEDGES

In passing over Ellesmere Island the novice naturally would have selected the valley route, which is at a maximum height of 300 feet and has at intervals possible landing places. Schur, Reber, and Bennett, the three pilots, preferred to have beneath them the snowcapped hills, which rise to an altitude of about

* See, also, "Flying Over the Arctic," by Lieutenant Commander R. E. Byrd, Jr., in this number of the NATIONAL GEOGRAPHIC MAGAZINE.

Photograph by Maynard Owen Williams

THE "BOWDOIN" HIGH AND DRY A MILE OFFSHORE IN MURCHISON SOUND

While on the way to Karna to take Commander MacMillan's favorite Eskimo helper home after an airplane trip to Igloolahonny, the flagship of the Expedition ran hard aground. A heavy deckload of gasoline drums was thrown overboard, but the sturdy little ship did not float until, near high tide, the wash from a bursting iceberg carried her off. All except six out of the 39 drums of gasoline were later rescued, in spite of a choppy sea and strong wind which carried them miles from the ship (see text, page 513).

4,000 feet, and to my surprise declared that they would rather take their chances with wheels than with skids.

### A DREAM THAT CAME TRUE

A second long flight on August 11, over a more southerly route to Bay Fiord, was of intense interest to me, considering that I had traveled every foot of it by dog team in all kinds of weather. What it would be like in the summer had been a puzzling question to me.

The reader can imagine with what pleasure I looked down from a height of 5,000 feet upon big hills over which we laboriously pushed our sledges in 1914-16 and in 1924. Stripped down to undershirts and reeking with sweat, we had wallowed in snow thigh-deep, yelling at out dead-tired dogs until our throats were raw and our voices gone.

At that time I looked up into the deep-blue sky of a beautiful May day and muttered to myself, "Some day the aviator will laugh at this!" The dream had come true, as dreams generally do if one persists in them.

With absorbing interest old camping places were recognized and various experiences recalled. Here the Reid Glacier, at right angles to the course of the valley, blocked it completely, forming a gigantic dam; behind it was a lake large enough for us to have landed on its surface if necessary.

Alexandra Fiord, an inlet of Buchanan Bay, was really inviting looking, with not a particle of ice and as smooth as a mirror. The ice condition in Flagler Fiord had improved considerably since our visit a few days before, affording landing places throughout at least one-half of its length.

### AN EMERGENCY DEPOT IS SIGHTED

Returning, we took a more southerly course, going east by way of the Beitstad Fiord (an arm of Hayes Fiord), which, to our surprise, was entirely free of ice. Skimming the tops of the big hills, we passed over Rice Strait (between the mainland and Pim Island, of which Cape Sabine is the northeastern extremity) to find, if possible, the hut and provision station built by the Canadian Government in 1924 with a view to the establishment of a Northwest Mounted Police station at that point.

As Schur spiraled down toward the *Fram's* winter quarters of 1898-99, we descried the square dot, which we knew to be the building, a short distance from the edge of the water.

We had learned from the Smith Sound Eskimos that they had visited the station during the spring and had found it filled with food—an emergency station for us, if need be, for we knew that our brother Canadians would not object to our using these supplies if it came to a matter of life or death.

### A MOTHER WALRUS AND HER BABY DISTURBED BY AIRMEN

We now headed out over the ice fields of Smith Sound for home. A few miles west of Littleton Island we saw a mother walrus and her baby sleeping on a pan of ice. As we dropped to an altitude of 100 feet, the mother sleepily raised her head, roused by the roar of the Liberty.

She was plainly perplexed as to the nature of this strange and gigantic bird swooping over her. She and her ancestors had feared nothing from the air, their sole enemies being man and the polar bear. Would she brave it out? She stirred uneasily, then prodded her little one, and away they lurched beneath the water, refuting the theory that when animals encounter a new enemy for the first time they exhibit no fear.

As the waters of Beitstad Fiord had been found to be ice-free, Commander Byrd decided to attempt to land supplies at its head, as such a station might be utilized on a return trip from Eureka Sound if food or fuel were needed.

Two of the planes succeeded in reaching the mouth of the fiord, but were unable to establish a station, owing to rough water and cross winds.

On August 12 the wind blew so hard from the south that nothing could be done. We spent the day watching the planes to prevent them from going adrift and in picking up empty barrels, boards, and half of the raft, used by the mechanics in working upon the planes, which a rough sea around the *Peary* had torn loose and thrown on the beach.

Photograph by Jacob Gayer

THE ONLY ICE PACK ENCOUNTERED ON THE RETURN VOYAGE

Summer sun and heavy seas had broken up the notorious Melville Bay ice, and the *Peary* made her way through this broken field with little difficulty.

The 13th was our unlucky day. Everything that had not happened previously seemed to occur then. The day was ushered in with a gale from the northeast, which later veered to the north. At 5:30 a. m. a boat broke loose from the *Peary* and went drifting seaward. With very little hope of ever recapturing it, I went after it in our 12-foot rowboat. Just outside of Etah Harbor I found it dashing on the rocks, half filled with water.

This salvaged, I reached the *Bowdoin* in time to see the *NA-2*, fastened by a long rope to the stern, slowly sinking, her seams having started in the rough sea. She was not to be outdone in the dramatic manner of her sinking. Bow first is the custom with big ships, and bow down she went, lifting her red, white, and blue tail high into the air, ready for the plunge (see, also, text, page 529).

Instant work by John M. Jaynes, my engineer, and Ralph P. Robinson, my mate, saved her. Rocheville, a Navy mechanic, who was always on his job, immediately freed the forward compartment of its load of plane equipment and water. Pumps were started and in a few minutes the *NA-2* was riding lightly again, but since the engine was filled with salt water a new one must be substituted.

A few minutes after this incident a volume of black smoke rolled up from the forward deck of the *Peary*. With her decks loaded to the rails with gasoline, was she on fire? A blazing bundle of waste was tossed over the rail; the fire was out.

### THE FIRST CACHE IS LANDED 107 MILES FROM THE SHIPS

The day ended with floe ice endeavoring to carry two of the planes out of the harbor. As a miniature berg scraped and crunched along the side of the *Peary*, Rocheville sat on the end of a plane wing with legs stiffly extended to ward off the enemy and save the fabric. This plane safe, we turned our attention to the *NA-1*, directly in the path of two small bergs driving fast before the wind. Our motorboats dragged the plane to one side, letting the bergs pass on their way out to sea. So ended one day in the Arctic.

With the *NA-2* now disabled, the *NA-1* and *NA-3* got away on the 14th and succeeded in landing their first cache of supplies at the head of Flagler Fiord, distant from the ship 107 miles. They returned to Ellesmere Island in the evening, but were unable to leave anything additional because of drift ice. A realization of the fact that, because of prevailing ice conditions in the North, no dependence could be placed upon a supply station once established was a severe blow to the plans of the Naval unit.

From my sledging experience and also from the reports of the natives, I had confidently believed that all of Flagler Fiord and Eureka Sound would be suitable for landing throughout the summer months.

### SECOND CACHE LANDED ON SAWYER BAY

August 15th was a beautiful day. The *NA-1* and *NA-3* got away at 10:45 p. m. in another attempt to land supplies at the head of Flagler Fiord, and, if weather conditions permitted, to go on into Cannon Fiord. At 8:30 the next morning they were back, reporting that Flagler Fiord was inaccessible. They had therefore gone on to the head of Sawyer Bay, on the north side of the Bache Peninsula, and had there left a small cache. (See Map of the Arctic Regions, supplement with this number of the NATIONAL GEOGRAPHIC MAGAZINE.)

The afternoon of the 17th was the finest we had had since leaving Labrador. Unfortunately, the *NA-1* required a new engine and the *NA-2* was permanently disabled.

Work continued on the third of our planes in the vain hope that something might yet be done. On the evening of the 17th, from the deck of the *Bowdoin*, some 200 yards distant, we noticed flames under the stern of the *Peary*, close to the *NA-3*.

It proved to be a fire on the water—burning gasoline which had overspread the surface. Before it could be extinguished, one wing of the imperiled plane was so badly scorched that it was decided to substitute a new one. To remove her engine and replace one wing would require at least three days.

Such happenings should not be credited to carelessness, for they occur from engine back-fire, repair torches, etc.

Photograph by Maynard Owen Williams

IN BEADS AND BOOTS

In south Greenland the chief charm of the women's costumes lies in bright red or blue boots, with mosaics of varicolored leather down the front, and in heavy bead collars, each weighing two pounds or more and each woven in a pattern devised by its wearer. Christina, whose photograph this is, would not like to be called an Eskimo, nor should she be, as the present population in the chief Danish settlements contains little Eskimo blood.

Photograph by Maynard Owen Williams

AN IMPROMPTU MOVIE CROWD ON THE DECK OF THE "BOWDOIN" AT HOLSTENSBORG

Wherever there were lonely missionary workers or curious natives along the route of the *Bowdoin* and the *Peary*, motion pictures were shown. In Etah the perpetual daylight made it necessary to darken the forecastle, but the total native population of 15 souls did not overcrowd the narrow space. Here, at Holstensborg, the nights were dark enough, so that the pictures, chiefly of Arctic scenes photographed on former trips, could be exhibited on the deck of the *Bowdoin*.

It was now August 18. As a result of 18 days' work, two small deposits of food and fuel had been advanced 107 miles only. All spare motors and three spare propellers had been utilized. One plane only was now available for flight and her wireless equipment was not in working order.

Under such conditions, although Commander Byrd was eager to take the remaining plane, unattended, across Smith Sound and possibly over Ellesmere Island, a forced landing and inability to take off again, or serious motor trouble, would have resulted in a delay in starting for home and possibly both ships, wholly unprepared for wintering in the Arctic, might be imprisoned for a year. I therefore vetoed the daring proposal.

In 18 days the planes had been able to land at a point only 107 miles from base in the direction of our goal—the vast unexplored area lying between Alaska and the North Pole. Could they possibly fly 2,000 miles in the remaining 10 days? Yet this distance must be covered if airplanes were to do work left undone by us with dogs in 1914-17. Figure weights and cruising radius of planes as we could, even eliminating all possibility of accidents, there seemed no way that the task could be accomplished before September 1.

### FLIGHT WORK IS TERMINATED

We might have reached Axel Heiberg Island and the edge of the Polar Sea, but nothing was to be gained by that. The Expedition had other worthy objects in view, and these would be daily sacrificed to no purpose. To delay even one week might result in failure of all our program.

Our photographers and scientists had been very considerate and patient, and had done everything possible to further the plans for putting planes beyond the limits of the known, yet they were all of

Photograph by Maynard Owen Williams

SEEING HERSELF AS THE GEOGRAPHIC SEES HER

In 1924 Commander MacMillan took a photograph of this Holstensborg girl, which was published in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1925. Nothing gave as much pleasure to her on the return of the *Bowdoin* as to see her own picture, taken the year before.

one accord that nothing could be gained by remaining longer at Etah. I therefore requested Commander Byrd to give up all plans for future flights across Smith Sound and make ready to return home.

Knowing from past experience that from now on Etah Harbor would be very inhospitable, that we could expect bad gales of wind down the fiord from the Greenland ice-cap directly upon our little aviation beach, it seemed wise to dismantle the two planes at Igloodahouny, in Robertson Bay, to the south, and therefore it was suggested that they fly down to this Eskimo settlement. The *Bowdoin* proceeded at once to await their arrival, but that night Gayer and his pilot, while securing aërial views over Smith Sound, barely reached Etah in safety, and the plane was utterly unable to fly down the coast.

Our decision to terminate our flight work seemed to be justified. The planes simply could not do the work required of them, at least not until the conditions so new and trying to planes had been studied and corrected.

### E-TOOK-A-SHOO TAKES HIS FIRST AIRPLANE RIDE

The *NA-1* arrived at Igloodahouny at 10 a. m. on the 22d. At eleven, with Bennett as pilot, I left for the Eskimo village of Karna, 25 miles to the southeast, to visit my old dog-driver, E-took-a-shoo, and bring him back by plane if he cared to come—a new experience for one whose career with me has ever been varied.

The waters of Inglefield Bay were so filled with ice that for the moment I doubted if Bennett, expert as he is, could make a landing in such rough water, for the wind was blowing at least 40 miles an hour. He dropped prettily between the drifting ice pans, lowered his wheels, by motor, and taxied up to a rocky shore, enabling me to land from one wing.

E-took-a-shoo was there, all smiles.

"Get your mittens and come on!" I yelled. Without inquiring where we were going, he turned and ran to his tupik (sealskin tent).

Photograph by Maynard Owen Williams

SEWING A TOP DECK ONTO A SUKKERTOPPEN KAYAK

The kayaks, or hunting boats, of the Greenlanders of Sukkertoppen are among the lightest, most graceful, and most easily handled of all those in the North. Sealskin, sewed on with reindeer sinew, forms the covering for a light wooden frame. The man standing is holding the hoop with which the opening is surrounded. The waterproof leather shirt is tied tightly about this, so that when the Greenlander puts to sea he and his boat form a single water-tight unit.

He came out, followed by his wife, looking a bit bewildered, and climbed into the rear seat, and we were off—he didn't care where.

As far as I could detect from his emotion, he had always been in the air. His trust in the infallibility of the white man's creation and the man who handled it was most interesting psychologically. He and In-you-gee-to, who flew at Etah, as far as I know the only Eskimos in the world to fly, will have much to tell during the coming winter, when they harness their dog teams and drive about, making those delightful visits with which the night-bound Eskimos pass the long winter.

PLANES FLY OVER GREENLAND ICE-CAP

Our flight work terminated with a short trip by Commander Byrd and Bennett up Robertson Bay and in over the Greenland ice-cap. The *Peary* arrived on the morning of the 23d. Leaving orders for her to follow the *Bowdoin* down the coast, we proceeded to Karna to land E-took-a-shoo.

The waters of this part of the North are almost wholly uncharted. Off the Redcliffe Peninsula (the tongue of land between McCormick Bay and Inglefield Bay), however, there is a dotted line indicating shoals. I might have known that this was put there by Peary and meant something definite, but a careful examination from the air on the day before failed to reveal any dangers.

We were going at full speed about one mile off the beach when there came a tremendous crash, hard enough, it seemed, to rip the whole bottom out of our staunch little ship and sounding especially violent to both Robinson and myself, who were down in the cabin don-

Photograph by Maynard Owen Williams

ALPINE SCENERY IN A GREENLAND FIORD

The *Bowdoin* is anchored in the tiny harbor in front of the village of Kornok, on Godthaab Fiord, between Godthaab and the Norse ruins. In the right foreground are two kayaks set bottom side up on stands to keep the sealskin covering from rotting.

ning oilskins in anticipation of a heavy rainstorm approaching from Inglefield Bay.

We scrambled up the ladder to the afterdeck. One glance was sufficient. We were high and dry, as a sailor would say, and so high forward that I knew we would not come off until the next tide (see illustration, page 504).

The all-important question right then was, "What kind of a bottom are we on?" If on ragged rocks, the *Bowdoin*, with her heavy deckload of 30 barrels of gas, might suffer considerably in spite of her staunch construction of white oak, armored with ironwood and backed with cement.

Over the rail the gas must go, and over it went, into a choppy sea, the heavy steel drums drifting rapidly off to leeward. Full speed astern was of no avail, for in the meantime the tide had dropped.

"Why not fasten the barrels together and anchor them?" one bright member of my crew suggested. Within one busy, soaking hour all but six had been captured and fastened to anchors.

### THE "BOWDOIN" COMES OFF THE ROCKS

To receive a serious injury to the hull of the *Bowdoin* 3,000 miles from home might place us in a predicament. It would relieve us of considerable anxiety to have the *Peary* standing by, in case we were in need of her help. She received our signals and rushed to our assistance.

Meanwhile the *Bowdoin* had listed so heavily to starboard and was so high on the rocks that we could walk under her prow and make an examination of her keel. We found the shoe almost completely gone and the keel itself so badly split and splintered that we trimmed off large sections with an ax. But, knowing the thoroughness of her construction, we had no fears whatever as to her seaworthiness for the homeward trip.

To watch the incoming tide flow over her rail and up the slanting deck was no new experience. It had happened in 1923 and 1924. We knew that she would rise as she did, and within an hour we were afloat and chugging along in search of anchored barrels. All but six were found and reloaded, and we proceeded to Karna, to land E-took-a-shoo.

Two hours' anchorage here convinced us that no ship should ever call at this port. Under the pressure of a strong northeast wind, great blocks of glacial ice came down across our anchor chain, threatening to pick us up bodily and sweep us down Inglefield Bay.

We were glad to up anchor, snap the bells, and scud before the wind for Cape Parry.

In the next two days, bucking strong head winds and heavy seas, and encountering fogs and snowstorms, both ships groped their way southward.

A last good-bye at a small encampment must be made if possible to deliver a few presents sent north by Miss Miriam Look, of Hope, Rhode Island.

From the crow's nest a landing seemed impossible because of closely packed ice. A small boat would never do it. Therefore I decided to work the *Bowdoin* in through the pack.

With Lieutenant Rigg, of the United States Coast and Geodetic Survey, throwing the lead whenever he could find an opening in the floe ice, hugging close to our hull, we sounded our way within 100 yards of the shore, and then, accompanied by Maynard Williams, who was always eager to embrace every opportunity to secure photographs for the NATIONAL GEOGRAPHIC MAGAZINE, I landed upon the rocks, not without difficulty, owing to a heavy swell following the recent gale.

It was up and down, grab and hold. With the help of the natives, who were especially active when they saw biscuit, tobacco, and other presents in the boat, we finally succeeded in getting a footing, and within a few minutes were surrounded by the whole contingent of men, women, and children.

Here was a summer encampment but a decidedly winter scene, a rare opportunity for Williams, who took advantage of every minute we could spare. A final "Good-bye!" and we were in pursuit of the *Peary*, far off in the ice fields, speeding south for home.

### HOLSTENSBORG, UNIQUE PORT OF CALL

Our next stop was at Holstensborg, the most interesting settlement in the Northern Inspectorate of Greenland. Years ago it was the home port of the

Photograph by Maynard Owen Williams

A GREENLAND UMIAK, OR WOMEN'S BOAT

These seemingly unwieldy craft, made of sealskin, rowed by women and steered by some graybeard of the community, are not seen as often as in former years; but when the boot and bead girls were asked to parade their umiak they readily launched it and drove it past, even when the wind in the sails opposed their efforts. From youth the Greenland women are strong wielders of the oar, and large boats can be seen in charge of mere infants, who, of course, cannot swim, the water being too cold to invite surf-bathing.

American halibut fishermen, some of whom are buried in the little cemetery overlooking the harbor. Its well-kept, painted buildings nestle among the rounded, rocky hills, each festooned with strings of dried halibut heads, food for the long winter to come. Its up-to-date canning factory is a pleasant surprise and its product, canned halibut, delicious.

Bucking a heavy sea and head wind, we proceeded slowly south along the coast to Sukkertoppen, the most impressive looking village that we visited in Greenland, with its popular Kolonibysterer, or Governor, Mr. Christian Langskov. No less popular was his congenial wife and even more so to the younger members of my party was his charming daughter, Ebba, twenty years of age.

Within a few minutes of our anchoring Governor Langskov visited the ship and gave us the "keys of the city," so to speak, and throughout our stay he was unremitting in his care and attention to every detail of our comfort.

Sukkertoppen might well be designated "The Venice of Greenland," situated as it is upon a collection of peninsulas and islets connected with bridges. So attractive did some of my men find this settlement that they declared that they would gladly remain there for the winter.

At Godthaab the *Peary* recoaled and since she was to go direct to Battle Harbor I made additions to the *Bowdoin's* crew by taking on Dr. Koelz and Jacob Gayer.

Koelz is the most energetic naturalist I have ever known. I believe that he accomplished more during the summer than many scientists in the North have done in years. Among his collections are 1,500 bird skins! And these in addition to fish and flowers galore!

## THE ARCTIC'S COLORS PHOTOGRAPHED FOR THE FIRST TIME

Gayer, the color photographer of the National Geographic Society, has succeeded in obtaining natural color repro-

ductions of Arctic life and scenes—the first ever to be made north of the Arctic Circle.

Gayer learned the necessity of keeping his plates cool while taking pictures of cacti for the National Geographic Society in New Mexico,* where a vault in a stone courthouse was the only safe depository for his autochrome plates when the temperature stood at 103° in the shade. But when he insisted on taking an electric fan to the Arctic his friends laughed. The explanation lay in the fact that color plates must be dried rapidly if their tints are to remain faithful.

The amateur may consider his small kodak a burden, but Gayer thought nothing of shouldering a 60-pound load in Greenland and walking miles with it, climbing slippery hills over treacherous rocks in pursuit of his color records.

The costumes of the Far North, the markings of new species of trout just as they are taken from the water, the red lichen which one finds on Arctic snow, the elusive tints in glacier and iceberg—these have been recorded on a photographic plate for the first time.

The cheery character of the Eskimo has been the cause of frequent comment, and such cheer as is faithfully recorded in color in Gayer's plates is truly contagious. Out of the frozen North to which he took a paradoxical but necessary electric fan, he has brought a record of smiles that will warm the heart of every admirer of his difficult but eminently successful work.†

Members of The Society may remember that one of the objects of our expedition was a study of the Norse ruins of Greenland, really the first chapter in American history. Near Godthaab was situated the so-called Western Settlement of the Norsemen, consisting of about 90 farms and 4 churches, and Governor Simony kindly appointed Doctor Börresen, resident physician, as our guide to a Norse building discovered some years ago, the best now standing in the Western Settlement.

* See "Canyons and Cacti of the American Southwest" in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1925.

† Many of Mr. Gayer's natural-color photographs made in the Arctic will be reproduced in an early number of the NATIONAL GEOGRAPHIC MAGAZINE.—EDITOR.

The Godthaab Fiord is 60 miles in length and as beautiful as it is long, revealing a composite picture of Norway and Switzerland—the fiords of the former, the snowcapped peaks of the latter. It was interesting to know that within a few yards of the shore we were sailing in waters nearly 2,000 feet deep; that some of the peaks towered almost from the water's edge to more than 5,000 feet in height! And more interesting was it to realize that we were sailing the same waters traversed by the hardy Vikings in their high-prowed open boats more than 900 years ago!

### THE FIRST GLIMPSE OF NORSE RUINS

As we approached the head of the fiord and beheld the glaciers descending from the great Greenland ice-cap we were "all eyes" for our first glimpse of a Norse ruin. In the gathering twilight it was very distinct—a square rock building, standing in the center of an elevated plain 100 feet above the water's edge.

It was with a feeling almost of reverence that we stood at the open door of what had apparently been a church, a beautifully built and well-preserved rock structure, in size roughly 20 feet square, with walls 10 feet in height. Its roof, probably of logs and thatched with turf, was missing (see page 516).

If it did serve as a church, naturally arises the question, "Why not windows?" In lieu of these we discovered small port- or peep-holes, for it is hard to conceive how anything, even arrows, could have been hurled through such small openings. I am informed by some of the Danish officials that churches served the double purpose of worship and defense, and it is possible that the Norsemen went to service, as our Pilgrim forefathers in New England did, with weapons in their hands.

Within a few yards of this structure were the remains of several buildings and also the rock outlines of their stockyards and barns for cattle, which we know they had—sheep, goats, and cows.

What little we had the good fortune to see—and we are extremely grateful to the Danes for this privilege—whetted our appetites for more and for further investigation in the future.

Photograph by Maynard Owen Williams

THE PRINCIPAL NORSE RUIN AT THE HEAD OF GODTHAAB FIORD

The farmer-sailor Norsemen had two colonies in south Greenland. This fortress-church at Ujaragssuit is one of the finest of the ruins in the smaller of the two settlements. About 20 feet square and 10 feet high, it is made of uneven slabs forming smooth exterior and interior walls with smaller rubble between. The land about this ruin is now a swamp covered with dwarf trees and bushes (see text, page 515).

We reached Godthaab on the night of September 17, feeling well repaid for the 120-mile run of the *Bowdoin*.

On the morning of September 21 we were away for Labrador with a fair wind and fairly good weather, but in the evening a gale came in from the northeast and east, with a driving rain and heavy sea.

After a stormy passage the Labrador hills of Cape Mugford loomed up through the driving mist, their tops white with new snow on the morning of the 24th. Appreciative of the fine harbors which had sheltered us in the past, we struggled against wind and sea to get up under the land before dark—a vain hope. We were forced to square away down the coast for Jack Lane Bay. At midnight we caught the welcome 2-second flash of Cape Harrigan, our first lighthouse since leaving the Labrador coast on July 19.

There was great rejoicing at the Bromfield home, on Jack Lane Bay, as we anchored in front of the door. Only that morning the family had discussed the lateness of our return and had given us up for the year, fearing that our good little ship had been frozen in the pack ice of the Far North.

No time to be lost. We were under way at daybreak, bound south for the Moravian settlement at Hopedale. Here we rid ourselves of that frightful load of Navy gasoline.

The *Bowdoin* was now a different ship. Her decks were clear. She was stripped for action.

Driving before rain and wind, the ship swept down the Labrador coast a frightened bird.

Off Cape Strawberry our main gaff snapped, but a new one, ordered by radio, awaited us at Battle Harbor.

Only one night here to fit our new stick and lace on the sail and we were away, heading down through the Belleisle Strait for home.

As we entered the harbor of North Sydney on the morning of October 6,

Pacific and Atlantic Photograph

THE "BOWDOIN," MACMILLAN'S FLAGSHIP, ARRIVING AT WISCASSET, MAINE, ON HER RETURN FROM THE ARCTIC

At the mainmast is the Stars and Stripes, at the foremast the flag of the National Geographic Society.

with the Stars and Stripes at the main and the National Geographic Society flag at our fore, we were instantly recognized by the various craft and saluted by several steamers, all of which we answered with our air whistle.

When half way up to Sydney we descried a powerboat awaiting us, one occupant of which was vigorously waving a large American flag. The National Geographic Society was the last to bid us Godspeed in early July, through its President, Dr. Gilbert Grosvenor, who accompanied us as far as Battle Harbor. It was the first now to welcome us home through its representative, Mr. J. R. Hildebrand.

No sooner were we docked than a throng gathered around the schooner.

Within four hours all of my men had received much-needed hair cuts, had enjoyed apples, bananas, grapes, and peaches; had read their mail and were ready for home. The *Bowdoin* had taken on one thousand gallons of fuel oil and declared she was ready for our last 500 miles.

We cast off lines at 1:30 and proceeded down the harbor and out to sea with a smashing fair wind.

If wind and sea had remained from the same quarter, we would have had a comfortable night, but as darkness came on,

the wind whipped around from the southeast to northwest, with vivid flashes of lightning and driving rain. A nasty cross sea caught the *Bowdoin* from every direction. She shipped tons of water over her bow and over both rails, threatening to wash some of my men overboard.

We finally shortened down to a foresail alone, to ease ship a bit. In taking down our forestaysail, or jumbo, Salmon was almost completely buried by a sea which swept over the bow, and Melkon was taken off his feet. Working in the pitch dark, they did well to remain on deck.

### A CLOSE CALL

Fearing for their safety and not hearing a sound above the roar of the wind and rush of waters, I left the wheel for a moment and ran forward to learn if they were still there. I found them tugging on the sail, endeavoring to lash it down to the boom. I had no sooner reached the wheel than the third member of my watch, Rawson, our fifteen-year-old cabin boy, was knocked down by a sea which swept aft along the deck, flush with the low rail—a close call.

At this moment the ominous slatting and banging of a sail revealed that the lacing on our foregaff had given way. This meant the loss of our most valued sail unless it could be taken in at once.

"All hands on deck!" and up they came with a rush, showing that each man had tumbled into his bunk "all standing," as we say at sea.

No man on shore can properly visualize such a scene—roar of wind, swash of waters, snap and crack of canvas and ropes—a little ship buried in froth, dark oilskin-clad forms working rapidly here and there, the blackness punctuated with orders from the officer in charge, as wave after wave reached over the rail, ending with a thud against lifeboat or cabin.

With engine full speed ahead, we were dropping backward, and there were times when the *Bowdoin* seemed to have decided to go back North. She headed east and fairly ran away with the bit in her teeth and her jaws frothing.

But the next morning was glorious—a beautiful fall day, and good weather.

All day we raced along in under the land—a glorious sail—with the *Peary*, which had been awaiting us at Halifax, slowly creeping up. Not until we rounded Cape Sable, however, and were well in toward Seal Island, on the last leg of our voyage, did she forge past us, her lighted cabins giving her the appearance of an ocean liner. Three long blasts of her whistle ended the race, as she crept ahead and disappeared into the night, heading up for Monhegan Island, off the Maine coast, nearly abreast of Wiscasset.

It may be of value to those who are interested in birds to know that all the next day various species came fluttering to our decks and rigging. Many of them were easily caught in the hand, although apparently not exhausted. Among them Dr. Koelz recognized the chipping sparrow, junco, ruby-crowned kinglet, black-and-white creeper, and myrtle warbler. Some of them flew down into our cabins, into the engine room, and even spent the night in our bunks.

At 5 o'clock in the afternoon we caught the faint outlines of Monhegan and headed for the southern entrance. As we entered and ran through the harbor, we were saluted by the *Peary* and by the islanders crowding the dock.

### A GALE AT HOME PORT THRESHOLD

We had arrived on time and were ready to leave for Wiscasset the next morning; but the next morning had no intention of permitting us to leave. At 5 a. m. I was aroused by the slatting of the halyards and the roar of the wind through the rigging. The gale increased in strength through the morning and by mid-afternoon we were in the center of a chaos of white water. Up to this time we had been anchored behind a ledge. I decided to go around into the harbor itself. Well we did, for that night Monhegan, with other parts of the American coast, experienced a real gale.

Sunday was little better. It was the irony of fate that, within 30 miles of home and thousands of people awaiting our return, we were unable to reach the mainland, but at 6 a. m., October 12, the *Peary* and the *Bowdoin* steamed out of the island shelter and at 9:30 anchored in Wiscasset, to be met by Governor Brewster of the State and by hundreds of people crowding docks and streets.

We were home!

# FLYING OVER THE ARCTIC

By Lieutenant Commander Richard E. Byrd, U. S. Navy (Ret.)*

Commanding Officer, U. S. Naval Aviation Arctic Unit

AVIATION will conquer the Arctic—and the Antarctic, too. But it will be difficult and hazardous. These things, however, only increase the extraordinary lure of the Polar regions.

It seems fitting that the United States Navy, so prominent in Arctic history, and the National Geographic Society should have joined hands last summer in Arctic exploration by aircraft. This work will not end until all the wonderful records made by the dog sledges have been surpassed and the heart of the great unexplored area reached—an area, containing a million square miles, which has so far baffled all attempts to penetrate it.

The world was determined that the North Pole should be reached, and now it will not be content until the secrets of this unexplored area are revealed.

Peary's great achievement was the culmination of centuries of effort, where tragedy was frequent and failure the rule. But each tragedy and each failure, along with each success, was a stepping stone for the next explorer who came along.

So it is with exploration from the air. The MacMillan Expedition has, we hope, taken aviation conditions in the Far North out of the column of the unknown, and we believe that in the air battle with the Arctic elements last summer we learned some facts of value to all future aviators in Polar regions.

At 5:30 a. m., August 2, the morning after the *Peary* reached Etah, the eight officers and men comprising the Naval Aviation Unit started to work, with the enthusiastic assistance of Commander MacMillan, the Eskimos and all hands, building with the airplane wing crates a runway for the planes on the ridiculously inadequate beach (see illustration, page 522).

* Commander Byrd had charge of the navigational preparation for the transatlantic flight of the NC flying boats, the *NC-4* being the first craft to accomplish the voyage by air; he was assigned as one of the navigational officers of the *ZR-2* for her proposed flight across the Atlantic from England to America; he prepared navigation data for the *C-5's* proposed first transatlantic flight by dirigible. This last-named flight was to have been from Newfoundland to the British Isles. The ship flew from New York to St. John, New Brunswick, and was there destroyed by storm. The author served as lieutenant commander in naval aviation during the World War.—The Editor.

## PLANES ARE ASSEMBLED IN THREE DAYS

Working in the open on the delicate parts with bare hands, and at times exposed to snow squalls, my men got the wings and disassembled planes to the beach, erected and flew them by August 4. The rapidity with which they did this is still a matter of wonder to me. With any other planes than the Loening Amphibians, with their combination wheels and boats, I do not see how the flying ships could have been dragged up on land.

The beach proved entirely too small and soft, so we moored the planes out to buoys, which were dropped several hundred feet offshore. We thereafter operated entirely from the water.

Some of the gales which the planes had to ride out in the harbor were so severe that our anchors, which ordinarily would have held planes twice the size of our amphibians, dragged, and it became necessary to keep the planes most of the time tied up astern of the *Bowdoin* and the *Peary*.

Almost invariably our hours of sleep were interrupted by the deck watch with a report that one of the buoyed planes was dragging anchor, that the wings of another were about to strike the ship's side, or that a miniature iceberg was bearing down upon a third.

The weather being calmest from midnight to seven or eight o'clock in the morning, we frequently flew during the night hours.

On August 4 we took our ten specially picked carrier pigeons ashore in the pigeon house, to get them oriented to the locality (see illustration, page 524). On the 10th we turned them loose, but only four of them returned. Chief Aërographer Francis, who acted as Navy pho-

Photograph by Maynard Owen Williams

THE CHIEF OF THE NAVY PERSONNEL WITH THE BUMSTEAD SUN COMPASS

Lieutenant Commander Richard E. Byrd, Jr., who had charge of the Navy unit, is here seen in Arctic flying costume. The sun compass was invented by Chief Cartographer Albert H. Bumstead, of the National Geographic Society staff. Because of the variations of the magnetic compass (see red arrows, the Arctic Regions map supplement) and the weakness of magnetic force in the Arctic, this sun compass, which can be used in clear weather throughout the midsummer months, was found of great value (see text, page 523).

tographer, meteorologist, and pigeon man, reported to me that they had been killed by Arctic falcons.

It would seem, then, that pigeons are not practicable for communication purposes in that part of the Arctic. We had thought that they might be used for communicating with Etah in case of a crash, if our radio was put out of commission.

We spent August 5 making radio tests and full-load tests. We found that, with the load of food, rifles, ammunition, boat, etc., stowed in the tail, a plane was thrown out of balance, so we spent the 6th taking a 33-gallon emergency gasoline tank out of the bow to make room for stowing the gear. At 7:00 p. m., August 6, fog descended, visibility became very poor, and it began to rain. The downpour continued for 24 hours, after which a southwest gale sprang up. This blow turned into a snowstorm the following day at 2:00 p. m.

### ONLY 15 DAYS LEFT FOR FLYING

From general conditions and information supplied by the Eskimos, it was realized from the first that we were having scarcely any summer at all, so the Naval unit put forth its greatest effort in accomplishing its work in the shortest possible time. In fact, it turned out that after the planes were ready for flight there were but *15 days* of "summer" in which to accomplish our mission.

It is an astonishing fact that of those 15 days only three and three quarters were good for flying; two were fair flying days and one indifferent. More than half the time was either dangerous or very dangerous for flying. Yet the three planes flew more than 6,000 miles, 5,000 miles of which were flights from Etah on the work of accomplishing our mission; and we saw 30,000 square miles from the planes, a large part of which, being inaccessible to foot travelers, had never before been

seen by human eye. Our first reconnaissance flight was to Cape Sabine, which lay on our proposed course toward the Polar Sea, 30 miles from Etah. We found that the ice began several miles north of Etah, and covered all the water to the northward as far as we could see.

Photograph by Jacob Gayer

THE FIRST AMPHIBIAN LEAVING THE "PEARY" AT ETAH

The three Navy planes were stored during the voyage from Boston on the narrow after deck of the *Peary*. Lowering them to the water, floating them to the rough, stony beach, and putting on their wings with Eskimo help was an extraordinary, if not unprecedented, feat, while changing the 900-pound engines in the planes, as they were tossed on the waves below the boom which supported the machinery, was an even more remarkable achievement.

### FLYING WHERE FORCED LANDING WOULD HAVE MEANT A SMASH

We flew low on that trip, hoping to find the ice smooth enough to land on, but it was rough and corrugated, and in such condition that landing upon it would have been as disastrous as landing among large rocks — a plane would have been completely demolished and, of course, the flyers probably would not have been able to walk away from the wreck.

We realized that the ice-landing skis which we had brought to use in place of wheels would be of no use to us under such conditions. There were pools of water on the ice and here and there open leads filled, more or less, with detached pieces of ice. It was easy to see why Ellesmere Island is inaccessible in the summer to the dog-sledge travelers.

### ENGINE CHANGED WHILE PLANE BOBBED ON WATER

In all the hundreds of square miles of ice over which we flew later on, we did not see a single place on the ice where a landing could be made without disaster!

The engine on the *NA-1* had developed a knock on the 5th and we decided to put in a new motor, for we felt that we had to do everything humanly possible to prevent a forced landing on the ice. The mechanics shifted the 900-pound motor with the rather jerky ship's boom, while the plane bobbed up and down in the water alongside the ship. I watched the men work, but it is still a mystery to me how they did it.

Bennett and Sorensen worked all day and all night connecting up the intricate

Photograph by Maynard Owen Williams

THE FIRST NAVY PLANE TO BE ASSEMBLED ON THE NARROW, ROCKY BEACH AT ETAH

This view, taken in a drizzling rain on August 3, shows the *NA-2* almost ready to take the air. Runways constructed of the sides of the wing boxes lead down into the water, which is near high tide. The wings for the two other planes are seen to the right, and in the distance is the pigeon house in which the Navy pigeons were kept (see, also, page 524).

mechanism of the motor, out in the cold and the wet, and reported the plane ready on the morning of the 7th. The work had been accomplished in about one-fourth the time I expected it to take. When the motor started and hit on all twelve cylinders, it was a very pleasant surprise. Then Bennett and Sorensen reported ready to fly! Rest seemed to mean nothing to them. But the weather was nasty and I made them turn in.

That is the kind of spirit every one of the officers and men with me displayed. No handicaps—and there were plenty—were too great for them to overcome. Any operation of planes at all in the Far North last summer was necessarily difficult, and no ordinary effort would have enabled us to cover 6,000 miles—a feat which evinces the great courage, indomitable spirit, and unusual ability of the personnel with me.

At 4:00 a. m. on the 8th, during a gale, the *N-1-3*, which was tied up to an anchored buoy, barely missed destruction from a drifting iceberg. Later she began to drag anchor, so we had to tie her up astern of the *Bowdoin*. The bad weather persisted until 7:00 p. m., when I immediately gave orders to prepare for our first long flight into Ellesmere Island to attempt to put down a base. I wish to emphasize the fact that on account of the distance to the center of the unexplored area from Etah, at least one base is necessary and two are advisable.

### THE FIRST LONG FLIGHT OVER ELLESMERE ISLAND

We left Etah Harbor at 9:10 p. m., with Schur, pilot; MacMillan, passenger; and Rocheville, mechanic, in the *NA-2*; and Reber, pilot; and myself, relief pilot and navigator, in the *NA-3*. Just before we took off, a herd of a dozen walrus came up a few feet from our plane. They apparently became enraged at it and dived toward us, but we gave the motor the gun and could not see them when they rose to the surface again because of the spray kicked up by the propeller.

Photograph by Jacob Gayer

THE "NA-2," THE FIRST OF THE NAVY PLANES TO BE LAUNCHED FROM THE BEACH AT ETAH, IN THE SHELTER OF PROVISION POINT (SEE, ALSO, PAGE 522)

To the upper right is the *Peary* and beyond her John's Glacier. In the background are Dodge's Mountains, 1,500 to 2,000 feet high, a polychrome tapestry of brown-black rock lightened by bright-orange lichens and with gray high lights formed by the droppings from the millions of little auks which nest and summer in the rock talus.

We set a course for Cannon Fiord, which lies on a line with Cape Thomas Hubbard on the Polar Sea (see Arctic Regions map supplement with this number of the NATIONAL GEOGRAPHIC MAGAZINE), from which Peary in 1906 thought he saw the high peaks of a great land to the northwest.

At last we were to find out whether or not we could navigate a plane where the north magnetic pole is on one side, off to the southward, and the North Pole is on the other side, and where the force of the earth's magnetism that acts on the compass needle is very weak.

I noted immediately that the steering compass did not move at all, but pointed east all the time. Fortunately we had provided a more sensitive instrument, which we called the navigator's compass. It began to swing at first, but after we had steered a steady course it finally settled down.

In clear weather the sun compass enabled us to do accurate navigation. I was delighted with it. Mr. Albert H. Bumstead, of the National Geographic Society, invented it for our trip and I consider it a great contribution to science (see p. 520).

When we reached Cape Sabine we took a bearing on two points 30 miles apart, the direction of which Peary had established, and found that in addition to the 103° of error caused by our being north of the magnetic pole, there was an additional error of 30°, an unheard-of deviation.

The course we wanted to steer over the ice was northwest, but on account of these errors of the compass we had to steer east by the compass needle. That was a curious sensation.

Photograph by Jacob Gayer

CHIEF AËROGRAPHER FRANCIS AND HIS PIGEON COOP AT ETAH

As soon as the ships reached Etah, the pigeons were ferried ashore to become accustomed to the surroundings, so that they could bring back messages in case of accident to the planes. After a week the birds were released; all except four were lost (see text, page 519).

As we flew over the ice of Smith Sound, we could see at a glance the area Peary and Bartlett had such a difficult time getting through with the *Roosevelt* in 1908. The thought occurred to me: How we could have helped Peary by indicating to him the direction of the very few open leads of water so easily visible to us, but so difficult to locate even from the crow's nest of a ship! I was impressed, too, with the fact that we were traversing in a few minutes areas that it had taken him days to cross.

We reached Cape Sabine at 9:40 p. m., and passed directly over the spot where 18 of General Greely's men died from cold and hunger. I have never seen a bleaker spot.

### A NEW CONCEPTION OF THE ARCTIC'S RUTHLESSNESS

Over to the northward we could make out Bache Peninsula, which Peary traversed in 1898 and where his hunters killed musk oxen for a fresh meat supply.

After passing Cape Sabine, the view that opened was magnificent and we were stirred with the spirit of great adventure—with the feeling that we were getting a comprehensive idea, never before possible, of the Arctic's ruggedness and ruthlessness.

I believe that we have a new story to tell of the grandeur of Ellesmere Island. It was evident that the greater part of the land we saw had been inaccessible to the foot traveler, who, keeping largely to the water routes, with the view cut off by the fiords' great perpendicular cliffs, could not have realized the colossal and multifold character of the glacier-cut mountains.

But there was no time to enjoy the view. Any slight engine trouble might require a landing, so I naturally looked about for some suitable place in which to put a plane down if necessary. The landing would have to be made flying at 40 or 50 miles an hour.

I searched carefully and did not see a single place on the land or on the water where a landing would not have meant

Photograph by Jacob Gayer

THE FIRST ESKIMO AIR GUIDE ABOUT TO HOP OFF

The one Eskimo at Etah who can understand English is In-you-gee-to, who was with Peary on his drive to the Pole. His willingness to serve in any way, his industry, and his helpfulness in assembling the Navy planes caused him to be chosen as the first Eskimo to act as an air guide in the Far North.

disaster. The land was everywhere too irregular and the water was filled with ice either broken up into drifting pieces or in large, unbroken areas. At that moment I realized we were confronted with an even more difficult and hazardous undertaking than we had anticipated. I knew, too, that no matter what judgment we exercised we would have to have a little luck to comply with Secretary Wilbur's last admonition to me to bring the personnel back safely. The Secretary had taken a great personal interest in the Expedition.

Commander MacMillan had confidently believed that the fiords would be free of ice. That they were not was due probably to the fact that we were having scarcely any summer.

We could not use the sun compass, as the sun was obscured, so we continued steering east by the magnetic compass. By sighting astern on known points I was delighted to find that we were almost exactly on our course. A little later, however, the wind-drift meter indicated a strong wind from the north and we had to change course about 10° to allow for it.

No idea of the extremely irregular and rugged character of Ellesmere Island can be gathered from the maps and charts, and many of the mountains we saw were

Photograph by Jacob Gayer

OVER ELLESMERE ISLAND

Cruel in reality, bristling with deadly rock masses and snowy peaks, this little-known land had an eerie fascination for the U. S. Navy airmen. Many of the most spectacular features of the Ellesmere Island scenery were not photographed, for cameras were left behind as "excess baggage" when the planes were loaded with every possible ounce of gasoline for supply bases.

uncharted. The higher mountains were snow-covered and their glaciers extended down to the sea.

### SNOW-CLAD PEAKS BAR THE WAY

We continued on to Knud Peninsula (the tongue of land lying between Hayes and Flagler Fiords), flying at an altitude of 4,000 feet. Low-lying clouds hung over the peninsula, with many rugged peaks appearing above them.

Ahead we saw very high snow- and cloud-covered mountains which appeared to be impassable. We kept on, however, hoping to find some way through, but soon realized that the clouds were so high that no aircraft loaded as ours was could possibly get over them. The weather astern had begun to thicken and the clouds covered most of the landmarks.

Weather conditions change very rapidly in the Arctic, a fact which is of great concern to the aviator, who can not fly through fog and clouds over the land as he can over the sea, since there is great danger of running into a mountain or cliff. Neither can he land and wait for the weather to clear, if he has no landing place! Nor can he keep on flying around, as his gas eventually gives out.

We decided to fly over the clouds and take a chance on finding Etah. Without a landmark it was necessary to steer a compass course. Luckily, we found a rift in the clouds over Smith Sound, with fog only in places here and there on the water. So we were able to make the ships' base without much difficulty, although a 30-mile wind from the north made rough landing.

Upon our return, Aërographer Francis handed me a report that a gale of great intensity was rushing toward Etah from the south. All flying was, therefore, "secured." A driving snowstorm soon set in, bearing out Francis' prediction. The next morning at 3 o'clock a piece of iceberg weighing perhaps 500 tons was driven by the gale between the *Peary* and the planes, barely missing the latter, and giving us some anxious moments.

### EAGER VOLUNTEERS FOR EVERY FLIGHT

A few hours later I called the Naval unit together and told them that I would never order any of them to fly over that land again. But when the time came they were always ready and eager to volunteer for any flying that was to be done.

That afternoon it was decided, in conference with Commander MacMillan, that we would try to get beyond the high, snow-covered mountains by going through a gap to the south of our course, even though this was a roundabout route to our proposed Polar Sea base on Axel Heiberg Island.

The gale subsided at 5:30 and we made a reconnaissance and radio test flight to Cape Sabine. We ran into snow over the Cape and found Ellesmere Island completely covered with fog and snow.

The weather cleared toward Ellesmere Island the next morning, August 11, so all three planes prepared to leave immediately for Bay Fiord to attempt to put down a base of fuel, food, and ammunition on its shore. I sent by radio the following report of that flight to the Secretary of the Navy:

> August 11th—Three planes left Etah this morning at 10:40. Personnel *NA-2*, Schur pilot, MacMillan navigator; *NA-3*, Reber pilot and Nold mechanic; *NA-1*, Byrd pilot and navigator, and Bennett pilot-mechanic, for the purpose of locating a landing place to form a base between Etah and Polar Sea.
>
> This base is absolutely necessary, as fuel and food must be deposited on shore of Polar Sea before a flight over it can be made.
>
> Passed over northwest end of Cape Sabine at 11:15. Reached eastern end of Flagler Fiord at 11:45. Altitude of *NA-1* 7,000 feet, *NA-2* and *NA-3* about 4,000 feet. Reached western end of Flagler Fiord at 12:07 p. m. Temperature bitterly cold several degrees below zero at 7,300 feet.
>
> Hundreds of mountain peaks to left all covered with dazzling white snow and clouds covering everything to right, with mountains much higher than shown on chart, as at altitude of 7,300 feet some of the mountains, most of which are not shown at all on maps, were hundreds of feet higher than plane. Saw much land probably never seen before.
>
> At 12:07 set course to 250° true, which made compass course of approximately 12°. Checked magnetic compass with sun compass and found that magnetic compass had 30° westerly deviation, which put compass 170° off the true course. Sun compass very good when sun is visible.
>
> Hit the eastern end of Bay Fiord at 12:45 p. m. The fiord was largely obscured by clouds. That part of the fiord which could be seen was almost entirely covered with ice. At 12:48 *NA-2* disappeared in clouds to the right and *NA-3*, which was having difficulty getting altitude, turned back toward Etah. *NA-1* continued to Eureka Sound southwest of Axel Heiberg Island 200 miles from Etah and found only one suitable landing place, which was on the northern shore of Bay Fiord in approximately longitude 85. (This landing place was only temporary, being an opening in the ice cleared by the wind.)
>
> *NA-1* returned to search for other planes, but clouds had closed in behind and had to fly over them. Set course for Beitstad Fiord and found it free of clouds and also ice. Approximately 100 miles from Etah. *NA-2* and *NA-3* reached Etah at 2:30 p. m. and *NA-1* at 3:15. Reber reported that he suffered slightly from snow blindness. All personnel suffered some from cold.
>
> Must take advantage of this good weather, so three planes will start to-night at 9:00 p. m. to establish a sub-base at western end of Beitstad Fiord. Will leave there food, cooking utensils, primus stove, rifle ammunition, and gasoline and oil. Personnel will be the same as for flight this morning except that McDonald will go in *NA-3* instead of Nold and Rocheville in *NA-2* instead of MacMillan. Distances are given in statute miles.

Photograph by Jacob Gayer

SISTER PLANES FLYING OVER ICE-BOUND SMITH SOUND EN ROUTE FOR ELLESMERE ISLAND

Along the Greenland shore fairly wide leads can be seen. What seems a smooth field of ice below is actually ridged into rough hummocks with towering icebergs added like the plums in a pudding. Chief Aërographer Francis is seen outside the cockpit securing a cinema record of this epic Arctic flight.

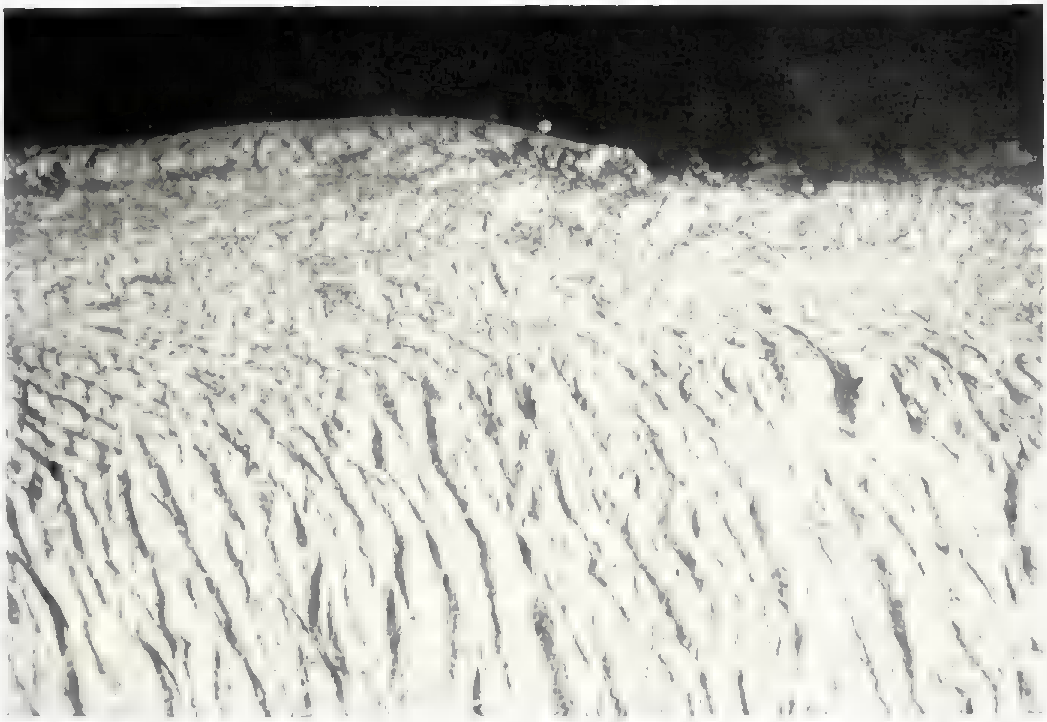
My joy at finding the *NA-2* and *NA-3* safe at Etah was great.

FIRST LANDING ON ELLESMERE ISLAND

On August 12 I sent the following report to the Secretary of the Navy:

> Left last night at 9:30 p. m. for Beitstad Fiord: *NA-3* Reber and McDonald; *NA-2* Schur and Rocheville; *NA-1* Byrd and Bennett. At 10 o'clock *NA-2* had to turn back, due to low temperature of motor. *NA-1* and *NA-3* reached eastern end of Beitstad Fiord at 11 p. m. Did not land in Beitstad Fiord, due to strong cross wind from southwest.
>
> This fiord is magnificent. Its cliffs rise straight up from the water for 2,000 feet. Landed on western end of Hayes Fiord, but strong wind rushing down from glacier made anchoring or taking the plane up to the rocky coastline impossible. Took off and both planes reached ship at midnight.
>
> Have found another spot free of ice where a landing might be made—the western end of Flagler Fiord. Commander MacMillan has agreed to establish a base there as soon as the weather permits. It blew a gale most of the day and Ellesmere Island has been covered with fog.

At last we had been able to land in the interior of Ellesmere Island, but the water



Photograph by Richard E. Byrd, Jr.

VERHOEFF GLACIER, GREENLAND, AS IT APPEARED AT AN ELEVATION OF 1,500 FEET

One of the most thrilling experiences of Navy airmen in the Arctic was the flight over the great Greenland ice-cap. On a day of remarkable visibility the *NA-1* took off from the beach at Igloodahoumy and flew directly over Verhoeff Glacier, mounting gradually to an elevation of 11,000 feet, from which the ice-cap could be seen for 100 miles in every direction. It was found that one area to the east attained an elevation equal to that of the plane itself—a greater altitude than had ever been reported for this great sheet of solid ice (see page 532).

had been dangerously rough. We noted on this occasion a very interesting thing. The wind rushed down the glacier, but changed its direction several miles from its foot. We afterward found that no matter what the direction of the wind elsewhere it generally flowed down the glacier and then subsided or changed its direction some miles beyond the foot.

Another interesting phenomenon experienced in the Far North was the difficulty of judging distances—something at which the aviator must be expert. This difficulty was occasioned by the great size of the cliffs and the clearness of the atmosphere—when it is not misty. When we landed in Hayes Fiord we thought we were landing a few hundred feet from the ice fringe on the shore line at the foot of the 2,000-foot cliffs, whereas to our great surprise we found ourselves more than a half mile away.

I shall pass over the operational difficulties we experienced from gales and ice and cold.

After being buffeted by a gale on the morning of the 13th, the *NA-2* began to sink. The engine was half covered with water, but MacMillan and his crew, by prompt and heroic effort, saved the plane. We later hoisted it on the deck of the *Peary* to change the water-soaked motor, but it was never able to fly again.

Having seen open water at the mouth of Flagler Fiord, we decided to attempt to put down a base there. I reported that flight to the Secretary of the Navy as follows:

> August 14th—At 11:45 this morning *NA-3*, Schur and Sorensen; *NA-1*, Bennett and Byrd, left Etah for western end of Flagler Fiord, 107 miles from Etah. Reached objective at 1:15 and found at last a place to land in water. Got planes 50 feet from beach and waded ashore with supplies. Deposited, 100 yards from beach, 200 pounds of food and 100 gallons of

Photograph by Maynard Owen Williams

THE "BOWDOIN" AND THE "NA-1" AT IGLOODAHOUNY AUGUST 22, 1925

The approach of winter drove the last of the Navy planes south from Etah to a sandy beach on Robertson Bay. The *NA-1* is here seen on the day of her last flight, when Commander Byrd and Bennett flew inland over the Greenland ice-cap, in a region where Peary did some of his early work in 1892. Behind the flagship *Bowdoin* can be seen the snowy slopes of Herbert Island, near whose shores the narwhal is captured (see, also, illustration, page 500).

gasoline, 5 gallons oil, primus stove, camping outfit, smoke bombs, rifle and ammunition, gallon kerosene and can of matches. At 3 p. m. large block of ice drifted into *NA-1*, but after half hour got her clear. Wind carries ice with great force.

Left Flagler Fiord at 3:35 p. m. and reached Etah at 5:10 p. m.

In order to take advantage of fair weather, as soon as planes can take on gasoline will leave for base and deposit gasoline and oil. *NA-3*, Nold pilot; *NA-1*, Bennett and Byrd. Taking only one pilot in *NA-3* in order to carry more fuel.

On that flight Nold said that he experienced the loneliest time of his life.

### IN FEW HOURS ICE COVERS LANDING PLACE

When we reached Flagler Fiord we found that during the few hours we had been away the ice had closed in and completely covered our landing place.

We then cruised about for some 60 miles attempting to locate a landing place in one of the other fiords, but were unsuccessful.

About a half hour before midnight, there was the effect of twilight among the fiords and in the dimness we lost track of Nold in the *NA-3*. Finally we located him, just a speck in the distance and apparently headed for the North Pole! We gave our motor all the power she had and after a good race overhauled him. What Nold's compass was doing, or what he was about, I have never found out, but I don't wonder that he felt lonely.

I had on polar bear trousers, Eskimo boots lined with sheepskin, and a reindeer-skin jacket—the warmest clothes known—but while leaning out of the cockpit to navigate I got very cold.

The next day we started out again. For a week Bennett had had very few hours' rest, but he insisted on going with me. Being the better pilot, he did most of the flying while I navigated and flew from time to time when I was sure of our location, and could let the navigating go for a while.

I made the following report of that flight to the Secretary of the Navy:

> August 16th—*NA-3*, Schur and Sorensen; *NA-1*, Byrd and Bennett, left Etah at 10:45 p. m. for Cannon Fiord. At midnight ran into fog and low clouds 105 miles from Etah. Mountains completely covered with fog, so impossible to get over them. Found that the base that we had put down in Flagler Fiord was still blocked with ice. Found some open water in Sawyer Bay. Landed at 12:15 a. m. and located break in ice foot large enough to beach planes. Ate a midnight lunch and waited for clouds and fog to clear. Thin scum ice formed in places during night. Finally at 4:15 a. m. weather cleared sufficiently to start for Cannon Fiord.
>
> Two planes took off, but Schur, in *NA-3*, landed and signaled that his motor had developed a knock that made it dangerous to attempt to get over the mountains. He was instructed to wait for *NA-1*, which went on alone at 5 a. m. to investigate Cannon Fiord.
>
> At altitude of 5,000 feet cleared mountains shown on chart at 5:20, and got over unexplored regions of Grinnell Land. Found high, uncharted mountains entirely covered with snow. Saw many square miles never before seen by man. There was an uncharted lake frozen over. The jaggedness, irregularity and many deep valleys presented a magnificent but awful spectacle. The air was the roughest ever experienced by us.
>
> At 5:30 reached high peaks that were completely covered with clouds. Made effort to get through, but it was impossible. Returned to Sawyer Bay, reaching there at 6 a. m., and planes deposited 100 gallons of gasoline, 5 gallons of oil and some pemmican. *NA-3* and *NA-1* started return trip at 7:05. Ran into 50-mile gale over Smith Sound and reached Etah at 8:30. Had difficulty tying up to ships, due to very rough water. It has been blowing a gale all day and snowed from 9 to 10 p. m.

Several times on that flight we had almost gone into a tail spin, due to the roughest air I had experienced in nearly eight years of flying. Bennett said he had never encountered anything like it.

### FLAMES ENDANGER PLANES

On the 17th the gale finally subsided. At 8 p. m. some gasoline on the water around the *Peary* caught fire and for a few moments it looked as if the *NA-3*, which was tied up astern, and the whole ship would go. Sorensen and Rocheville used splendid head work in casting the *NA-3* adrift immediately and Lieutenant Schur showed great calmness and judgment in procuring a fire extinguisher and throwing it to Nold, who was on the flaming plane.

My diary for the 17th has the following entry:

"The saving of the *NA-3* from destruction by fire to-day was just another example of the fine spirit of the personnel the Navy has assigned to me for this

duty. Whether we succeed or fail, they deserve the highest success. They have overcome almost insuperable odds that the elements and poor facilities have brought about. They have been indefatigable and courageous, and whenever there has been a job to do they have needed no commanding officer to tell them to do it, to spur them to greater effort.

"What they have accomplished on this trip has been almost superhuman, and even if we succeed in the highest measure it can not increase my pride in them. Their attitude seems to have been to live up to the best traditions of the Navy. They never hesitated to spend hours flying over areas where their lives depended entirely on the reliability of the engines."

### ONLY ONE FORCED LANDING IN ARCTIC

There was one forced landing during our Arctic work, but it did not come until we were ready to leave Etah, where there was open water.

By the 20th the burned wings on the *NA-3* had been replaced by new wings, a new engine installed, and we were ready to go again; but on that day Commander MacMillan gave orders to get ready for the return trip. He stated that the head of Etah Fiord had frozen over the night before and that a forced landing in Cannon Fiord or Eureka Sound would certainly result in a freezing-in of the planes.

The leader of the Expedition was right. He knows the Arctic, and it is due to his good judgment that the personnel and the planes got back to this country safely.

We were all depressed that we could not go on with our work, for we were learning the location of the few water landing places and we never gave up the hope of accomplishing our mission. With more time and a better season, I am confident that the unexplored area could have been reached.

However, there was another great adventure ahead of us—the flight over the Greenland ice-cap. We spent several days making photographic flights, and on the 22d the *NA-1* and *NA-3* left Etah for Igloodahouny, 50 miles south of us. Reber piloted the *NA-3*, with Gayer, of the National Geographic Society, as photographer, and Nold as mechanic; Bennett, Francis, and I were in the *NA-1*.

A half mile from Etah the engine of the *NA-3* threw her connecting rod and stopped dead. Reber was forced to land and had to be towed back. The *NA-3* was then put on the *Peary* alongside the *NA-2*.

I was sorry to see Reber have that hard luck, for, due to serious illness, he had been able to make only two flights over Ellesmere Island. He is one of the most courageous and experienced flyers in the Navy.

### FLIGHT OVER THE GREENLAND ICE-CAP

After landing to see that the *NA-3* had gotten down without injury, we continued in the *NA-1* to Igloodahouny, where we found a fine beach. We landed and made camp.

At 3:15 Bennett and I left for a flight over the Greenland ice-cap. The visibility was wonderful that day, and we climbed to an altitude of 11,000 feet. We could see 100 miles in every direction. As we got farther in over the ice-cap it grew bitterly cold, although at 7,000 feet we had encountered a warm stratum of air.

We were flying in a direction a little south of east over a part of the ice-cap never before explored, and we saw in the direction we were going that it reached an altitude equal to that of the plane—11,000 feet—higher than any altitude heretofore reported (see, also, page 529).

To me the Greenland ice-cap is one of the great natural wonders of the world—1,500 miles long, about 630 miles wide, with an area of 700,000 square miles of solid ice and averaging over a mile in height—the world's great iceberg factory.

The glaciers near the foot are greatly crevassed, but farther up, where they join the ice-cap, they are fairly smooth and firm. The shape of the ice-cap seems to be that of the crystal of a watch, so that it would be difficult to land an airplane near its edge without dashing into a crevasse; but 50 to 60 miles inland, though a bit rolling, there seem to be flat places where a plane with skis could land.

We returned to Igloodahouny literally frozen stiff, but we were proud of the *NA-1*, for she had flown more than 2,500 miles in the Arctic in every kind of weather, and she appeared to be in just as good condition as when we started.

# HISTORY'S GREATEST TREK

## Tragedy Stalks Through the Near East as Greece and Turkey Exchange Two Million of Their People

By Melville Chater

Author of "Rediscovering the Rhine," "Through the Back Doors of Belgium," "Through the Back Doors of France," "The Land of the Stalking Death," etc., in the National Geographic Magazine

EVER since the expulsion from Eden, man has been trekking, and folk wanderings are the roots of his history; but with 1922 began what may fairly be called history's greatest, most spectacular trek—the compulsory intermigration of two million Christians and Moslems across the Ægean Sea. Slowly gathering impetus through the centuries, of a sudden these human tidal waves reared and burst on its shores.

This trek, brought about by the startling recuperation of Turkey after her defeat in the World War and her subsequent triumph over the Greeks in Anatolia, eventually developed into a regulated Exchange of racial minorities, according to specific terms and under the supervision of the League of Nations. But the initial episodes of the Exchange drama were enacted to the accompaniment of the boom of cannon and the rattle of machine guns and with the settings painted by the flames of the Smyrna holocaust.

### THE FIRST DERELICTS OF THE TREK

The first human derelicts of the Exchange were the Anatolian Greeks, who moved seaward in long files on their 500-mile trek from behind the Turkish Nationalists' lines. Though most of them lived several weeks' walking distance from the war zone, it is conceivable that the Nationalists did not relish having in their rear the distant kinsfolk of their Greek antagonists. And so, through 1920–21, the flow of the deportees, leaving uncounted dead among the snowy mountains and scorching plains of Asia Minor, went on.

For more than two thousand years inner Anatolia had mothered these descendants of the adventurous spirits who had followed Alexander the Great into Asia. A thousand years still earlier its coasts had been Hellenized by pre-Greeks fleeing from their invaded homeland. Now, exiled from their vine-clad cottages and bazaar booths, the deportees huddled half-naked in seacoast market places, hailing, like castaways, whatever chance vessels might rescue them from the ever-rising waters of refugeedom.

And thus the first 100,000 in history's greatest trek slowly filtered into Greece.

When, in the late summer of 1922, I steamed in between two far-flung promontories, while the sun spilled over Mount Pagos to illumine the vast sweep of red-roofed houses clothing its flanks, I little realized that I was watching one of the last dawns to rise over ancient Smyrna.

Once ashore, on the shipping-crammed quay, my companion and I threaded among camel trains and through narrow streets from whose overhanging balconies two neighbors might almost shake hands.

A climb to the topmost arch of Mount Pagos' crumbled fortifications afforded a view of the outspread checkerboard of Smyrna's sedulously separated quarters—the Turkish marked by minarets and cypresses; the Frankish, outstanding with fine residences, and the Greek and Armenian, crammed with an amazing density of small shops—the whole red-roofed panorama girdled by an illimitable sweep of blue waters which stretched horizonward within the gulf's embracing shores.

### A SIX MONTHS' CATACLYSM OF FLEEING PEOPLES

"Let's make a last snapshot of Smyrna," we said, before descending from Mount Pagos. Indeed, it may have been the very "last," since a few weeks later that magnificently outspread scene of peace and prosperity lay in ashes; for upon the Turkish offensive of August 26 the Greek army collapsed on a 150-mile front.

© E. J. Hardcastle

A REFUGEE FROM THE BLACK SEA PORT OF SAMSUN

He took part in the trek of the "first hundred thousand" Greeks from Asia Minor (see text, page 533).

The ensuing six months' cataclysm of fleeing peoples came as if there had been telepathically broadcast in great waves that swept Anatolia, Smyrna, Thrace, and Constantinople, the instinct of panic. The Greeks in these widespread areas suddenly awakened to find themselves on the brink of a whirlpool.

Refugees from anywhere within 150 miles inland herded seaward into Smyrna. At first they came in orderly trainloads or in carts, with rug-wrapped bedding, some little household equipment, and perhaps even a few animals. But as the distant military momentum speeded up, the influx became a wild rabble of ten, then twenty, then thirty thousand a day. Their increasingly scanty possessions betokened a mad and yet madder stampede from the scene of sword and fire, until September 7 saw utterly destitute multitudes staggering in, the women wailing over the first blows of family tragedy, whereby mothers with no food for their babies had been forced to abandon their older children in wayside villages.

By now Smyrna's broad quay swarmed with perhaps 150,000 exiles who camped and slept there, daily stretching their rugs as makeshift shelters against the sun, whose furnacelike heat was the mere forerunner to a terrible epic of fire.

The American consul general summoned his fellow nationals—the staff of the American college, together with local representatives of relief organizations and commercial firms—and formed a unit, later known as the American Disaster Relief Committee, for the distribution of bread along the quay.

All day long of September 8 and far into the night sounded the tramp of Greece's defeated troops surging toward the transports that chafed under full steam; then these, followed by the harbor's entire shipping, fled seaward. And, like a rising curtain, the dawn revealed only the grim hulls of neutral warships, come to "observe," across that com-

merce-deserted harbor, the catastrophe of Greece's Asian adventure.

A few hours later there came riding into Smyrna and past its close-barred shopfronts a body of Turkish cavalry, black-uniformed and scimitar-bearing, their left hands raised aloft, as in reassurance, while they called "Fear not!" to the white-faced populace huddled in side-alleys.

Before nightfall the whole division was in, with two infantry divisions following.

### A DANCE OF FLAMES BECOMES A FIERY HURDLE RACE

A few days after the triumphal entry of the Turks, the army of quay-squatters saw flames dancing in the old, wood-constructed Armenian quarter, a mile and a half away. The dance became a fiery hurdle race, as the wind-fanned flames leaped from balcony to balcony across the narrow streets; then the race became a hungry conflagration whose roaring mouth ate through and gulped down that mile-and-a-half breadth of city down to where the refugee multitude huddled between a waste of fire and a waste of sea.

And now fresh multitudes were disgorged upon them—fleeing Smyrniotes laden, refugeelike, with snatched-up babies and bedding. The city had become a Titanic blast furnace, whose wind-driven flames fanned the quay with so dreadful a heat that the multitudes dipped their blankets in the sea and swaddled themselves. Maddened horses, their harness afire, ran amuck through the press, leaving a wake of crushed bodies, which roasted where they lay.

All afternoon, until the sun died in rayless eclipse behind a cindery pall, and all night long, by the glare, the flood of men and beasts debouched from doomed city upon delirious quay. Affrighted faces mingled with wild-eyed animals, and human cries with the neigh of horses, the scream of camels, and, last, the squeaking of rats, as they scuttled by in droves from the underworld of a lost Smyrna.

Some of the destroyers had crept in close enough for men aboard to behold pandemonium's silhouette against a two-mile frontage of leaping flame, to sicken at the unforgettable odor of Smyrna's hecatomb, to catch the shrieks with which

Photograph by Ernest B. Schoedsack

AN ANATOLIAN GREEK GIRL OF KONIA

She is wearing the parti-colored costume which was fashionable a hundred years ago in the Greek colonies.

Photograph by Ernest B. Schoedsack

ANGORA, THE "BOOM TOWN" OF ANATOLIA

Since it has become the capital of the Turkish Republic, this ancient inland city, 220 miles southeast of Constantinople, has experienced a mushroom growth.

Photograph by C. D. Morris

A SECTION OF THE TREKKING TRAIN OF 5,000 CHRISTIANS WHO MADE THEIR TRAGIC WAY FROM KHARPUT TO THE SEA

Although Kharput, in central Asia Minor, is only 160 miles by air line from Trebizond, on the Black Sea, these unhappy refugees were forced to pursue a circuitous route which stretched to 500 miles (see text, page 557).

Photograph by C. D. Morris

DYNAMITING THE WALLS OF BUILDINGS ALONG THE QUAY DURING THE SMYRNA FIRE

the multitude's outermost ranks, hurled back by its scorched inner ranks, toppled over the jetty's verge and into the sea.

Beside this nightmare of 300,000 souls crushed together on Smyrna's quay, with no escape through the encircling ring of sea and fire, tales of burning Ilium faded into futility.

When with dawn the Disaster Relief Committee's workers headed their motor cars toward the quay, at times dismounting to clear corpses from the streets leading thither, two-thirds of Smyrna lay blackened and smoldering, an outstretched chaos. From the announcement board of a charred cinema theater, standing stark amid desolated acres, glared like a red-lettered epitaph "The Dance of Death!"

High on Pagos' crests rose the unscathed Turkish quarters' minarets like symbols of victory.

### DESTITUTE THOUSANDS LIVE IN CELLARS AND ON THE QUAY

When, three days later, the conflagration had exhausted itself, 100,000 people withdrew from the quay to the cellars, these thronged *"abris"* recalling wartime Paris under air raid, while outside went on bombardmentlike explosions, with smoke clouds ballooning skyward over the dynamited buildings (see page 538).

For another week the remaining 200,000 continued to live, and die, and bring other beings to birth on that unforgettable quay. With Smyrna's bakeries burned, or idle because of water shortage, they gorged on raw flesh, torn from animals' carcasses, or on the sea biscuit that the American sailors brought ashore in tins.

Burned, too, were all hospitals and their occupants; so within that multitude—so densely packed that one could not lie down without being crushed to death—women gave birth to stillborn babies and sheltered them against their dried-up breasts, for lack of a burial place, until some fresh stampede—perhaps over the arrival of a bucket of water—opened a momentary pathway for them to lay their burdens in the all-receiving sea.

By now the emerald-clear waters showed a bottom strewn with the drowned, and gangs of body fishers were coolly plying hooked lengths of telegraph wire for the loot of finger-rings and turned-out pockets (see illustration, page 565).

How to escape from a harbor where lay only neutral warships? Yet nightly these vessels lent at least their searchlights' protection; for, from wherever the quay lay black, there wafted seaward a great multitudinous cry, telling of the presence of night gangs among their victims; then, with the searchlights' blinding swerve upon the spot, the moaning would die away.

Only once a civilian craft appeared, and from it stepped red-fezzed officials, who cut twelve rams' throats and knelt by the streaming blood to thank Allah for their nation's victory.

### DISASTER COMMITTEE SAVES 60,000 FAMILIES FROM DEPORTATION

Because of a lack of ships to bear them away, 60,000 refugee families, of all classes, from peasants to bankers, were to be "deported," as the dreaded phrase ran, "into the interior."

It was now that the Disaster Committee, whose workers had not removed their clothes for a week, performed a unique service. With the Turks' formal assurances that Greek vessels not flying their national flag or docking at the quay would be exempt from seizure, one of the Committee sped by destroyer to Athens, where, upon written guarantees embodying these assurances, he rounded up a squadron of rescue ships and returned with them to Smyrna.

Meanwhile the Turkish command had notified the Allies of its permission for the removal of all refugees except males from 17 to 45 years (see page 562).

Almost simultaneously revolution burst over Greece. On Mitylene and Chios 75,000 defeated and disaffected troops commandeered warships and merchantmen, then embarked for Athens, displaying mock effigies of royalty and singing republican songs. In the capital the joyous scenes of three years before had been replaced by the spectacle of stunned multitudes upon whom airplanes were showering manifestoes that urged national salvation by revolution.

Over Smyrna's refugees on the eve of the evacuation another manifesto-dropping airplane, a Turkish one, was circling.

The handbills informed this homeless and now governmentless multitude that those not out of the city within a week's time would be deported. This resulted next morning in the mad stampede of 350,000 people toward the quay-traversing barrier that led to several other such barriers on the railroad pier. Anchored in the harbor lay the long-awaited ships—how hopelessly small and few they seemed!—Greek ships flying the American flag.

Uncounted hundreds were crushed to death or pushed over the quayside to drown, on that first day, when eight ships, convoyed by American destroyers, departed with 43,000 souls aboard. For those left behind there remained but six more chances—a chance a day—then the black despair of deportation into the interior (see pages 558 and 562).

Six more days at the barriers, where women's shrieks told of wives being pushed through to liberty and of husbands dragged back for the rope-gang, consisting of male deportees in file between two long wrist-binding ropes; where women so bereft and men so detained went mad and leaped into the sea; where all were searched and the despoiled wealthy were turned back at the final barrier, so that they might reappear to-morrow with a fresh supply of money; where the sudden sighting of a rescue ship brought death by crushing or drowning; where the night patrol sighted secret swimmers—deportable men—passing through the pathway of a destroyer's searchlight, which, while the pursuing shots rang out, suddenly veered elsewhere at some humane commander's order of "Switch it and give the poor devils a chance!"

With the Turks' house-to-house search, 100,000 cellar-hiders were added to the diminishing quay population, this necessitating a time-extension of six days.

### THE FLIGHT OF THOUSANDS FROM THRACE

By October 8 the evacuation was complete. Disregarding the great number of deported men and youths, 300,000 people had been evacuated in a fortnight, 180,000 of them under the supervision of the United States Navy and the Disaster Relief Committee, assisted by British naval forces. Estimates of the Smyrna disaster placed the loss of life at 10,000 and the property destruction at $300,000,000. And thus this second wave in the great trek passed over into Greece.

By now, addresses before the League of Nations were urging that body to act in the crisis. But though 400,000 refugees were scattered at Athens, Saloniki, Rodosto, and the Ægean islands in lots of 50,000 to 100,000, the crisis was not yet. On September 23 an Allied note had retransferred to the victorious Turks East Thrace, which had been annexed by Greece under the Sèvres Treaty. This triangular "backyard of Constantinople" stretched westward from 25 miles behind the city to the Maritza River and contained 600,000 Greek and Turkish farmers, in about equal racial proportions.

Bulletins giving a month's notice of the withdrawal of the Greek troops and the entrance of Turkish gendarmerie were to be posted in order to allay possible panic. But panic was already abroad, as inextinguishable as Smyrna's. Within one week of the quayside evacuation, Thracian Greeks saw Greek troops striking camp and marching westward.

"You're coming back?" the farmers anxiously asked.

"No," was the response.

And within an hour villages were deserted. Household goods and sacks of seed grain were flung into wains, the oxen were hitched, then the little community trekked westward, out of the backyard of Constantinople.

Village by village the sight of the departing soldiers surprised women grinding at handmills, men on the threshing sledges, always with the same instant result—the dropping of tools, the crowding into hastily loaded farm wagons, the departure westward.

Many a local official ran out, protesting: "Turn back! Get your harvest! You've a month yet."

Always the same, dull, fate-ridden response: "No. All is lost. We must move into Old Greece."

Everywhere throughout the plain the word passed, the trek began, the endless caravan lines took form.

Ahead the sky grew dark. Rain fell in torrents, washing out roads and swamping fields, as this Christian hegira into Greece moved slowly, multitudinously on.

THEY MUST BEGIN SCHOOL ALL OVER AGAIN

The tens of thousands of Moslem children, transferred under the Exchange of Populations from Greece, spoke only Greek, though their forefathers spoke only Turkish. Hence, upon landing in Asia Minor, they had to learn a new language.

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THE FIRST-BORN IN HIS CRADLE

The first-born son shall, says the Koran, "have the preëminence above women because of all the advantages wherein God has caused the one to excel the other," and therefore he "shall claim a double share of any inheritance." Meanwhile, according to custom, he is lying packed in pulverized sand, and swaddled, and if he cries he will be given a piece of Turkish sweet wrapped in a rag.

THE FORT OF RUMELI HISSAR ON THE EUROPEAN SIDE OF THE BOSPORUS

This castle, built by Mohammed II in 1452, preliminary to the siege of Constantinople, commands the narrowest part of the Bosporus, only about 800 yards wide. The swift current of the strait is here known as Sheitan Akindisi (Satan's Stream).

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IN THE GOLDEN HORN, PORT OF STAMBOUL

Mohammed II brought his fleet to this harbor overland from Rumeli Hissar by means of greased planks, after the Greeks had blocked its entrance with chains. The caiques, in the foreground, are the gondolas of Constantinople and are used in transporting passengers between ships and quays. The tall masts of fishing smacks are seen in the background.

THE SWEET WATERS OF ASIA

Near by rise the towers of Anatoli Hissar (Anatolian Castle) built by Mohammed the Conqueror's great-grandfather, Bayezid I, immediately opposite Rumeli Hissar (see opposite page). A Moslem poet describes the Sweet Waters of Asia as surpassing all other beauty spots in Asia.

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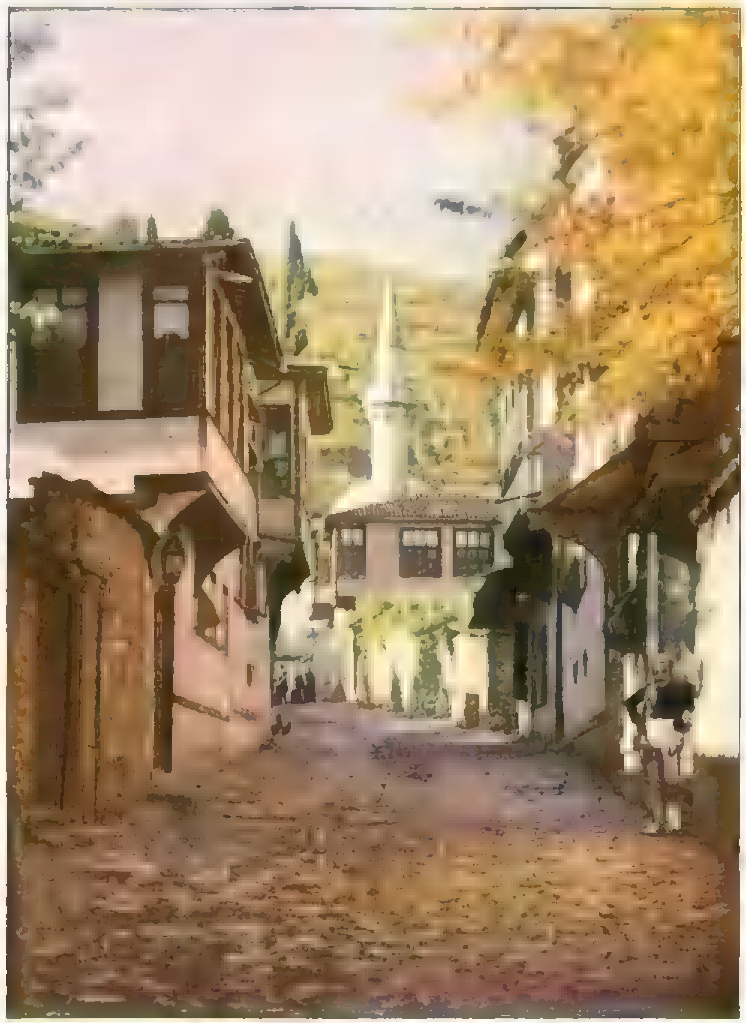
IN STAMBOUL'S RESIDENTIAL QUARTER

By night the *bekji* (watchman) on his rounds bangs his baton on these cobbles every few hours, to wake you up and inform you that all's well. Or perhaps he shouts a warning as to where a fire may be, for these wooden houses of Stamboul burn like tinder, and several thousand may be destroyed in a few hours.



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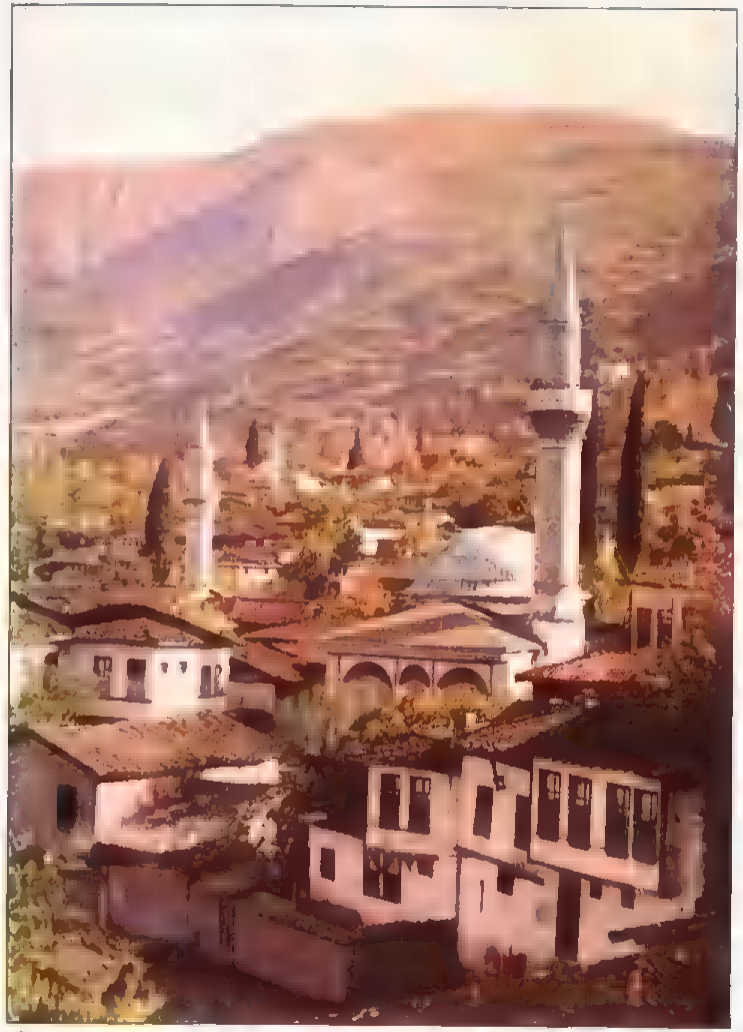
THE HOUR OF REST

Not far from this ancient city of Brusa is Kutaia, home of beautiful glazed pottery and tiles. The entire dome of the Yeshil Turbeh (Green Tomb) at Brusa is covered with tiles of exactly the shade shown here—the color associated with the Prophet and with holy men generally. The medallion set in the tile is a sort of monogram of interlaced Arabic letters meaning "The Possessor of the World" (God).

A STREET SCENE IN BRUSA

Here, as in less sanitary municipalities of Asia Minor, the cobbles slant toward the middle of the street, so that the drainage can collect and be flushed away with the first heavy rain. Brusa is one of the few important towns of Anatolia whose winding thoroughfares are lighted at night, the illumination being provided by lanterns hung outside each householder's door.



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MOSQUES AND MINARETS OF BRUSA

There is a saying in the Near East that this historic city of Asia Minor has a mosque and a walk for every day in the year. In the background rises the Asian Olympus, called by the Turks, Keshish Dagh.

THREE LITTLE MAIDS FROM ISLAMLAND

Not yet old enough to be concerned with the necessity for veiling their faces from the photographer, they nevertheless have covered their hair as a symbol of modesty.

GALATA QUAY, OPPOSITE SERAGLIO POINT : CONSTANTINOPLE

The grower of these onions is assessed the *ushr*, or tenth of his crop, either in cash or in kind, as a government tax. These vegetables, as well as beets, saffron, pomegranate rinds and walnut leaves are used for dyes for rug wool. Since the Exchange of Populations began, the commerce of Constantinople has declined woefully.

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THE TOMB OF MURAD II AT BRUSA

Because the Moslem monarch expressed the wish that his grave be exposed to the elements, like that of any common man, there is a hole in the dome, through which the rain falls. Many of Turkey's early sultans are buried in this city.

CYPRESS-SENTINELLED BRUSA

For centuries before the Turks began their westward drive across Asia Minor, Greeks had settled here and had given the name of their Home of the Gods to the mountain which towers behind the city. Tradition says that Brusa was founded at the suggestion of Hannibal and was for a long time the seat of the Bithynian kings.

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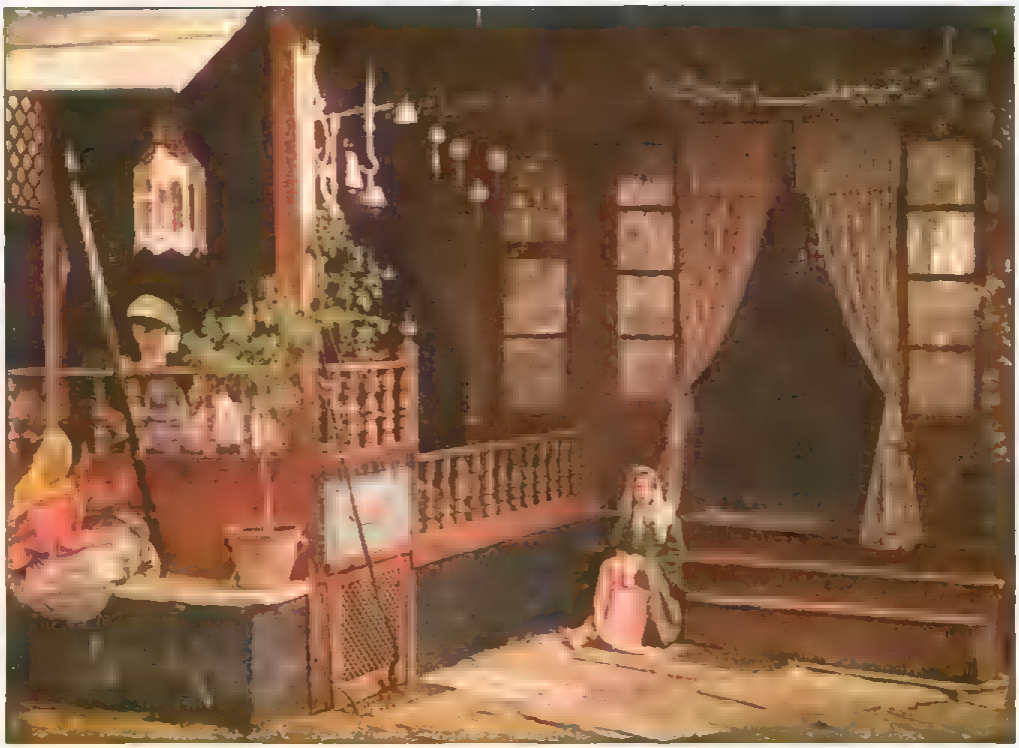
A SHOP IN KONIA

The Turks are expert workers in leather and are especially partial to red-topped boots, like those shown here. The shopkeeper has brought his customer a cup of coffee to be sipped while a bargain is being struck and the footwear is being tried on.



THE INNER COURTYARD OF A TURKISH HOME

The inscription over the doorway is a motto taken from the writings of Saadi, the famous Persian poet: "Do not rely on the wealth of the world, as it has elevated many like thee only to destroy them."

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GIVING HER HOUSEHOLD INSTRUCTIONS FOR THE DAY

The mistress (*hanum*) of this Turkish home is seated on a divan in the courtyard of her house (see above). In the harem of a well-to-do Turk the hanum usually is surrounded by numerous slaves.

A CHILD OF DAMASCUS

A Moslem girl is not required to assume the *yashmak* (veil) until she is twelve or fourteen years of age. It is fast losing all significance in the Near East except as a national headdress, although the Nationalists have announced that the custom would be restored.

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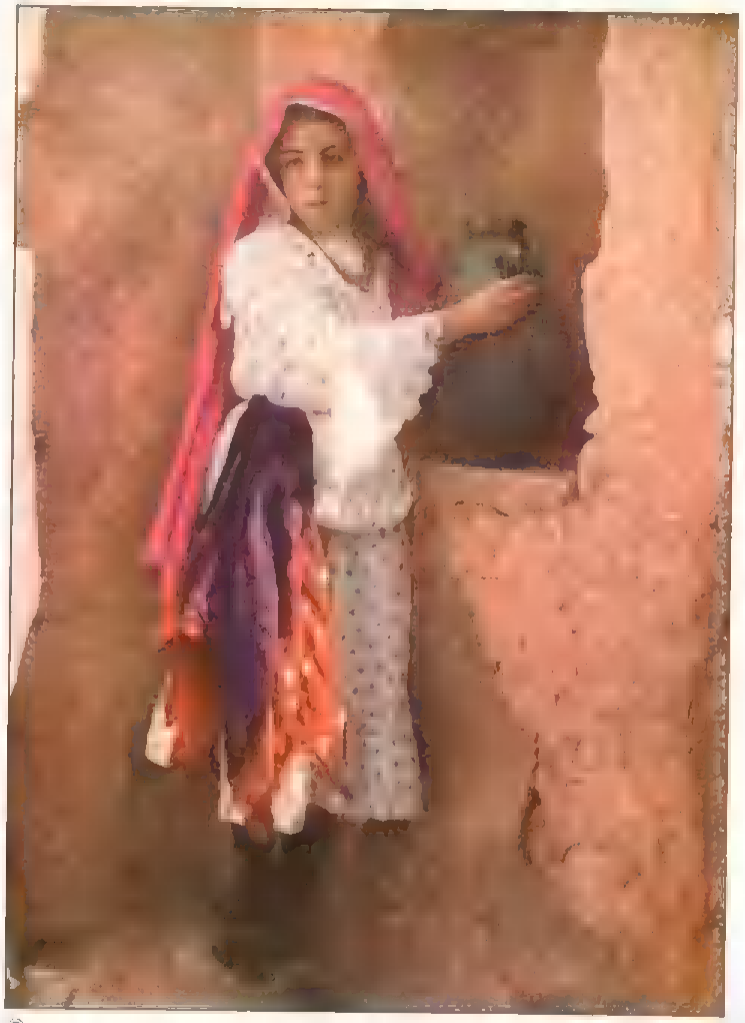
MELONS AND PUMPKINS FOR SALE

The genial old merchants are wearing the long *aba*, familiar throughout Persia, Syria and Asia Minor and called by the Christians of Kaisariye "the coat without a seam." The big whisks are used first for sprinkling the dirt floor with water, then for sweeping it.



RESTING ON THE WAY FROM THE FOUNTAIN

The Koran's words, "By water everything lives" are commonly inscribed on Moslem public fountains. Near Eastern water-jars are unglazed and porous, the evaporation keeping the water cool. Fresh-water supply was one of the great problems aboard closely packed ships during the Exchange.

THE COFFEE BEARER

With water, Arabian coffee and sugar as the ingredients "1-1-1" are the proportions, one of sugar and one of pulverized coffee to one demi-tasse. This, with sweetmeats, is offered as the invariable hospitality to guests in Near East homes.

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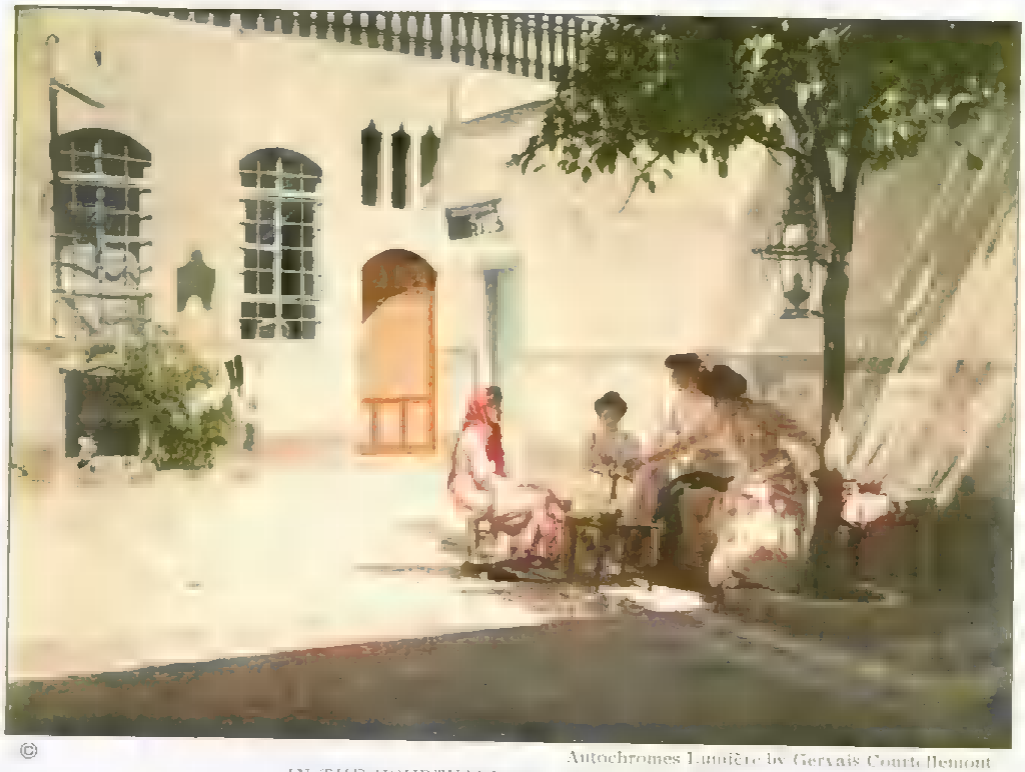
SYRIAN FRUIT VENDERS DISPLAYING GRAPES OF DAMASCUS AND MELONS OF HAMA

Both Anatolia and Syria are fruit countries. Much fruit is dried, but canning and preserving industries are practically unknown. The young melon merchants at the railway stations in hot Syria are always well patronized. The boiled-down syrup of the grape, which in this part of the world is regarded as the king of fruits, makes *pekmez*, which is used like apple butter.

THE COURT OF A MOSQUE OF A TEKKEH, OR MONASTERY FOR DERVISHES



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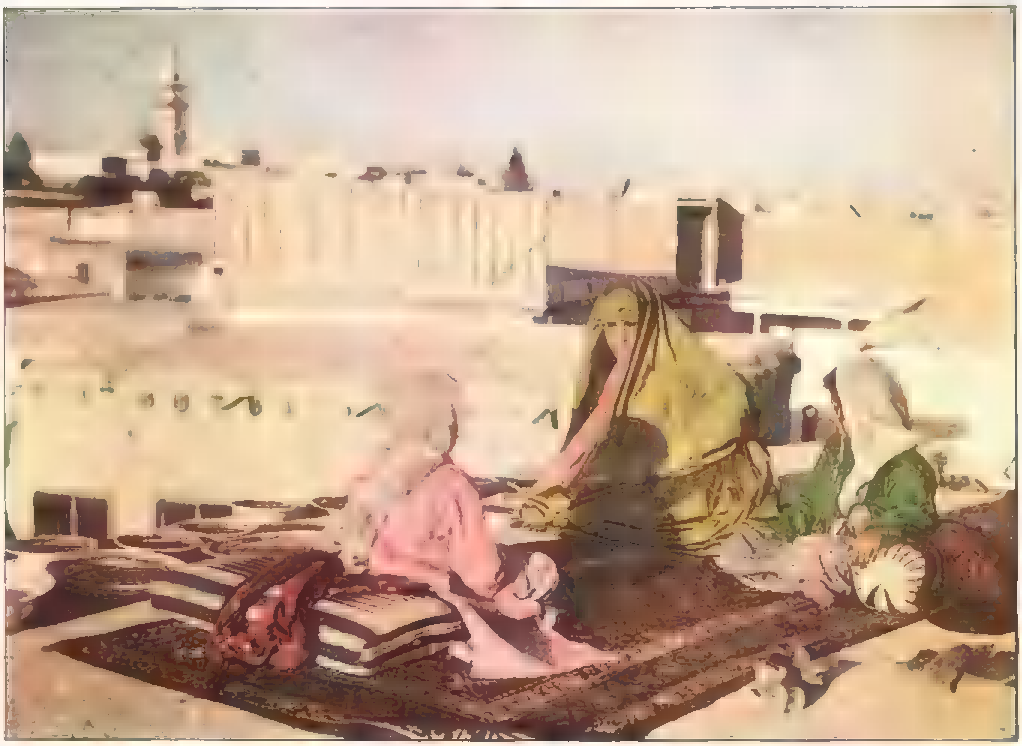
IN THE COURTYARD OF A SYRIAN HOME

The women of this wealthy household find the courtyard refreshingly cool during the day, and frequently repair to it in the evening also, as indicated by the lantern suspended from the branches of the lemon tree.



A SWEETMEAT PARTY ON THE ROOF OF A MUSSULMAN HOME

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READY FOR A DESERT JOURNEY

The ass is always the pacemaker for the camel, who is the freight car of the desert. This photograph was made near Damascus, on the caravan route to Hit, on the Euphrates, 70 miles northwest of Bagdad.

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CHRISTIAN WOMEN OF PALESTINE WHO WERE FORMERLY TURKISH SUBJECTS

With the surrender of Syria to French mandate and of Palestine to British mandate, many Christian peoples were relieved of allegiance to a Moslem power. Note the large antique veils in the illustration at the left. These women are all Nazarenes, and their village is Bethlehem, birthplace of Jesus.

©

A YOUNG WOMAN OF BETHLEHEM

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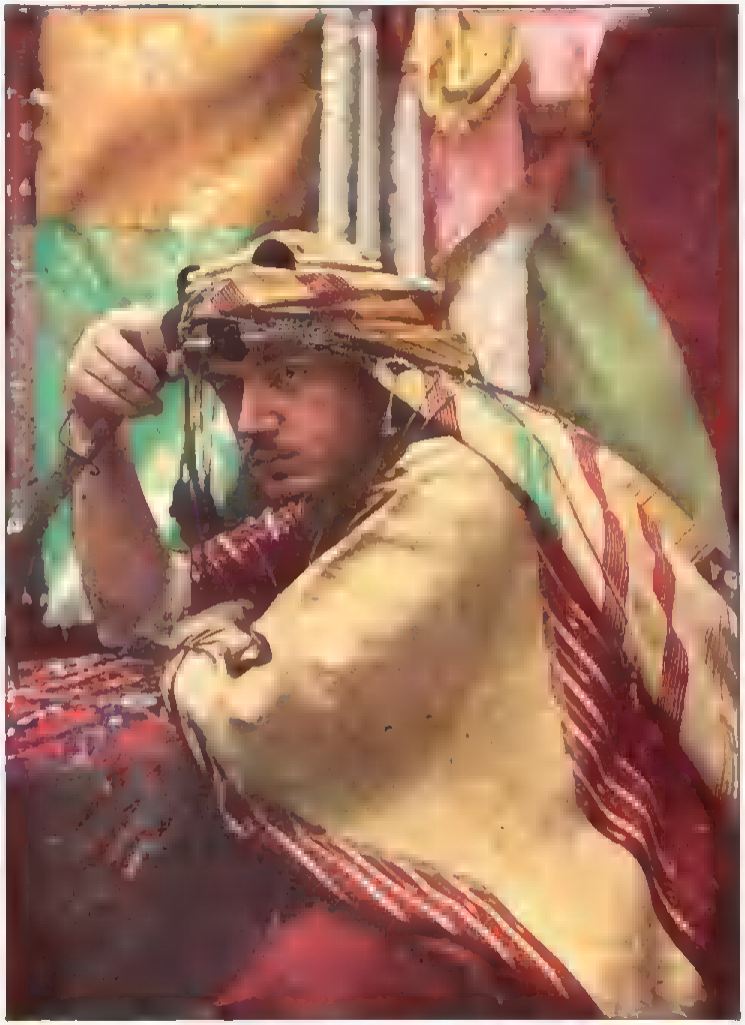

AN ARABIAN EMIR OF DAMASCUS

OLIVE DEALERS OF DAMASCUS

Olives are the butter of the poor in the Near East. The green fruit is seldom seen, the natives preferring it ripe and full of oil. If a Turk or a Greek goes on a long journey, as in the case of the Exchange of Populations, he provides himself with a huge disk of bread, a bag of olives, and a few dried fish.

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CHRISTIAN WOMEN OF DAMASCUS

At Rodosto 28,000 trekkers descended the cliffs to camp on the wind-swept beach, waiting there for rescue ships until they were on starvation's verge—this while in the deserted interior their harvest mildewed where it lay (see page 577).

Through Adrianople 60,000 poured during the first six days. So fast had action followed upon rumor that those trekking from nearest Constantinople saw throughout the entire line of march only moving caravans and deserted villages where, a few weeks later, starved cats and dogs were devouring each others' carcasses.

Men and women, trudging ahead to lighten the fast-miring wagons, bore shotguns; for thousands of the *comitadji*—those stormy petrels of the Balkans—were ambushing and raiding the emigrants. Many a wain entered Dedeagatch or Adrianople with the wife leading the oxen and her man's body stretched across the grain sacks.

### "AN EPIC OF RAIN"

By day and night, but always through that equinoctial downpour, the self-exiled host, which had mounted to 180,000 in twelve days, plodded on toward the marshlands of the ever-rising Maritza. For a few hours the oxen would be outspanned and families would snatch sleep, lying for warmth against the steaming stomachs of their cattle, while with a shriek and a blaze of lights the luxurious Oriental Express would thunder by. Then the trek, or rather tortoiselike race of mud-caked carts and weary oxen to gain the river before it became impassable, would go drearily, doggedly on.

From the Maritza's banks, where incoming roads converge upon the Karagach bridge, or from the river-commanding rooftops of Adrianople, one could watch the last lap of the flight: by day the desolate prairie, over which, from foreground to skyline, wound the endless, snakelike procession, gray under slanting rain; by night the swaying streak of lanterns across black infinitude, up from which arose confusedly the lowing of cattle, the sharp whip-cracks, the dull rain-drench, the thousandfold scream of wooden wheels rasping on wooden axles.

Watchers who had said of Smyrna's awful pyrotechnics, "It is an epic of fire!" said of East Thrace's multitudes, bowed under the lashing downpour, as if it were the whips of the Fates, "It is an epic of rain."

And thus 300,000 crossed the swollen Maritza and strewed its western banks; and thus the third wave in the great trek, now mounting to 700,000, passed across the frontiers of Greece (see page 586).

### GREEKS FLEE FROM CONSTANTINOPLE

Already another, a mere wavelet of 25,000, had gathered head in Constantinople and along the Dardanelles while the Nationalists' army was wheeling northward from the conquest of Smyrna. Arriving at the capital amid a greeting of green war flags and rams' blood, their Commissioner Extraordinary, after several conferences with the Allied chiefs, had announced, "And, by the way, since noon the city government, in our view, no longer exists. Accordingly I have assumed control."

That night Stamboul's minarets were festally illuminated, while past Pera's foreign embassies thronged Turkish-student crowds, shouting, "Down with the monarchy! Long live new Turkey!" And thereafter whoso among the Greeks could conveniently depart from the capital did so.

When Friday came, with its historic *selamlik*—the Sultan's progress to prayer—the waiting crowds were turned away, for overnight Mohammed VI had fled to Malta. And, finally, a Nationalist occupying force entered the city, crossed Galata bridge over flower-strewn cobbles agush with rams' blood, and ascended Galata hill among a sea of red fezzes, while sirens shrilled to Europe and Asia the news that the Turks were back in Constantinople.

Hardly had these events taken place when a Nationalist edict, posted throughout Asia Minor, announced "permission" for all non-Moslems to leave the country before November 30. Upon this notification the remaining Christian population of inner Anatolia arose *en masse* and fled for the Black Sea coast.

Almost immediately 40,000 women, children, and infirm—their men being held as prisoners of war—swamped the

BOAT LOADED WITH REFUGEES LEAVING THE RAILROAD PIER AT SMYRNA

British sailors, in white uniforms, assisted and directed the embarkation; American sailors worked farther back, on land, and at the entrance to the pier.

Photographs by C. D. Morris

AT THE LAST BARRICADE: SMYRNA

The Railroad Pier juts out a quarter mile into the Smyrna harbor, with several lines of track running its entire length. All persons wishing to leave Smyrna were herded on land at the base of the pier, and then passed through a series of four barricades, where Turkish soldiers weeded out those who were not allowed to go (see text, page 540). At each barricade those taken out were grouped as prisoners, at one side, until they could be removed. Here the prisoners are seen at the left, guarded by Turkish soldiers. There is a line of women and children with bundles at the right, passing on to the ships. Those allowed to go to the ships have been four times searched and have four times presented their credentials. A British sailor stands by the telegraph pole in the foreground. An American sailor stands atop the barricade at the gate.

Photograph by C. D. Morris

AMERICAN SAILORS MOVING REFUGEES ON A HAND TRUCK: SMYRNA

seaport of Samsun, and within three weeks 250,000 more were tramping the snowy roads toward Trebizond, Sinope, and Ineboli (see page 537).

"Permission" had been construed as "expulsion," and from as far as 500 miles inland villagers and townsfolk assembled, their backs piled with bedding and cradles, turning for a last glimpse of roof and vineyard, as they set out across the wintry plain.

With ship-deserted quays, as at Smyrna, and with the Black Sea ports glutted with sidewalk-sleeping, disease-breeding paupers, who had been thrifty cottagers a few weeks before, the gap was finally bridged by the arrival of Greek ships flying the Stars and Stripes and convoyed by American destroyers.

By January, 1923, some 80,000 refugees, or about one-tenth of this, the fourth and most formidable wave in the great trek, had reached Greece, where the never-ending influx at last became so insupportable that Athens slammed her official doors, protesting against "further expulsions."

The alternative proved to be disused barracks and barrack stables near Constantinople as the dumping ground for 100,000 Anatolian Greeks, where they died at the rate of 300 a day.

### A GLIMPSE AT LIFE IN THE REFUGEE CAMP

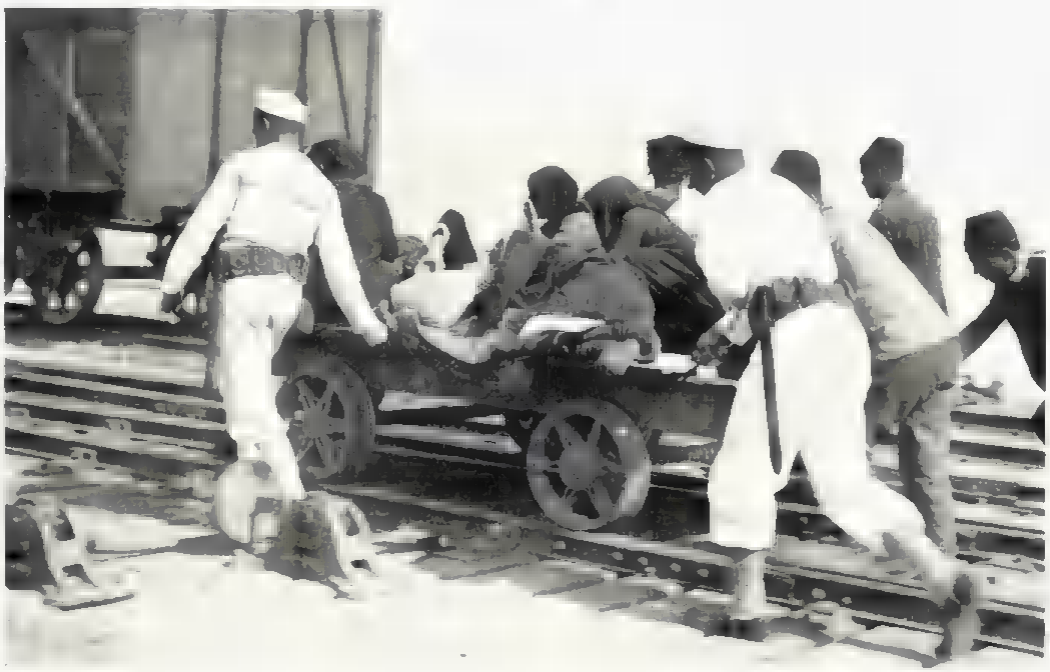
Could any eyewitness portray, far less any reader imagine, the miracle of mute heroism, self-respect, and cheer that kenneled in those yellow Selimiyeh barracks? (see, also, pages 570, 573, and 587).

This vast, gloomy space within four walls, once whitewashed, but now grimy as the earthen floor itself—can it serve this inpouring, heavily laden multitude of women, children, and old folks as anything more than a morgue? Yet immediately they pile up their boxes and sacks and stretch burlap curtains, thus creating waist-high party-walls, each tiny partition containing a family. The morgue has become at least a kind of cattle-pen.

In each family the mother builds a fireplace out of a few stones; the children heap it with bits of firewood. Soon the copper saucepan bubbles with its few handfuls of maize; the family rug is spread with all the ceremony of laying a communion cloth. The black-eyed baby scrambles about, gurgling. The wrinkled

BRITISH AND AMERICAN SAILORS WORKING SIDE BY SIDE DOING STRETCHER WORK AT SMYRNA

The topee-shaped hat of the Britisher distinguishes him from his American fellow worker with round white cap.



Photograph by C. D. Morris

AMERICAN SAILORS TAKING REFUGEES TO A RELIEF BOAT ON A HAND CAR

This car is running on rails down Railroad Pier (see, also, illustration, page 558). It took ten hours for the refugees to pass the pier barricades, at each of which they were examined, the men of military age being manacled and deported into the interior to make roads.

Photograph by C. D. Morris

BOATS CARRYING REFUGEES FROM THE BURNING ZONE OF SMYRNA TO A RELIEF SHIP IN THE HARBOR (SEE TEXT, PAGE 540)

grandmother hangs an image of the crucified Christ on a burlap curtain. The cattle-pen has become a home.

They may live or die, according to the typhus' lightninglike preferences; yet while they live you will find among them no mendicant whinings or supplicative palms. The children will forage for wood and for the herbs and roots which compose refugee fodder; the mother will keep the dirt floor sprinkled and do the family washing; the grandmother will lift aside the burlap cradle curtain to show you little Giorgios asleep, and with a patient smile will explain, if you ask, the mystery of how refugees exist. It is, simply, "We all help one another."

And, meanwhile, behind Greece's officially closed doors? A small country of no great natural wealth, she had just emerged from 10 years of continuous mobilization and intermittent wars, culminating in a recent defeat, only to be plunged into refugeeism on a colossal scale. Without reference to the total results of the Exchange, Greece had received within a year of the fall of Smyrna 1,250,000 exiles. This 25 per cent leap in her population meant that to every four citizens throughout the land one homeless and usually destitute person had been added.

### NO PARALLEL FOR GREECE'S PLIGHT

And what of the land itself? In Old Greece, as of 1912, more than three-fifths of the total area was uncultivated and useless. While, largely as a result of the Balkan Wars, her territory has expanded to 53,000 square miles, only one-fifth of this was under cultivation or pasture in 1923.

Because of mountains or swampy land, by far the major portion of Greece lay unredeemable or as yet unredeemed when the inrush of exiles began. She must still depend largely upon other countries for grain, and her total cereal production

WEEDING OUT MEN FOR DEPORTATION: SMYRNA

Photographs by C. D. Morris

TURNED BACK

After the fire these unfortunates, being between the age limits of 17 and 45 years, were not permitted to leave Smyrna with their families, but were sent back to the interior of Anatolia (see text, pages 539 and 540).

Photograph by Lex W. Kluttz

GREEK REFUGEES FROM ASIA MINOR ARRIVING IN MITYLENE

The fertile island of Mitylene (Lesbos), the second largest in the Ægean Sea, possesses in the Gulfs of Hiero and Kaloni two of the finest harbors in the world.

for 1923 was scarcely more than one-half the amount needed.

There is no adequate parallel whereby to convey even remotely a picture of Greece's plight in 1923. One may imagine Arkansas or North Carolina, each having about the same area as Greece, as being suddenly swamped by a million and a quarter immigrants; or one may imagine the United States as being overrun by 26,000,000 destitute foreigners. In the latter instance, supposing that they arrived at the highest annual rate in our immigration history, this would take twenty years. But if, as in Greece's case, they arrived within one year—if in New York, Chicago, and San Francisco each two citizens were forced by law to shelter one refugee—the crisis of a 25 per cent increase would become apparent.

By now Athens and Saloniki were surrounded by tented plains and resembled classic engravings of besieged cities. And the besieging hosts were those of Hunger. Daily from out these canvas-covered slums, over which the Acropolis showed golden against a turquoise sky, came women to sell their trinkets, rugs, sewing machines, until all they had brought out of Asia Minor had gone for handfuls of coarse grain and they had become recruits in the national dole-line of 800,000 people.

TYPHUS AND SMALLPOX THIN THE RANKS OF THE DESTITUTE

Then Nature's terrible correctives appeared. Instead of a birth rate, which had dropped to zero, typhus at 36 centers and smallpox at 60 centers throughout the country's 800 refugee localities yielded by January, 1923, a death rate of 1,000 daily.

To avert the horrors of a plague-swept Greece, a quarantine station for incoming refugee ships was established off the coast at Makronisi Island (see page 576) by an American organization, while other American agencies were in the field with food relief, medical assistance, and orphanage work. For by now the world had been stirred by this cataclysm of peoples, and seven American and five European organizations were coöperating variously with the Greek Government.

The Greek Government itself, up to

Photograph by C. D. Morris

ARRIVAL OF AMERICAN FLOUR AT THE QUAY IN SMYRNA TO SUCCOR THE DISTRESSED POPULATION OF THE BURNED AND FAMISHING CITY

November, 1923, when the League of Nations assumed the problem, had semiestablished 72,000 families in Macedonia, providing them with draft animals and seed grain. Meanwhile the remaining three-quarters of Greece's mushroomlike increase continued to carry on, as somehow refugees mysteriously can, by helping one another.

From being parked in tents, schools, churches, and theaters, the exiles actually advanced in some cases to constructing suburbs for themselves. At Athens, upon learning that some near-by mud flats could be squatted upon, 3,000 women, children, and old folks emerged from their parking corners in and about the Theseion and other classical ruins and swarmed off to build themselves a village (see page 572).

Now, every Anatolian born knows the use of clay, and here was plenty of it. The old folks gathered chaff, the women mixed it with the clay and cut this into bricks, the children played hod-carrier, the walls were erected on the refugee principle of helping one another, and the baking sun did the rest (see page 583).

Soon miniature shops were selling nuts and dried figs, cobblers were working at rough benches, and girls were knotting and clipping at rug-frames. In a few short months this trek from classic temples to mud tenements was accomplished, while from afar there gazed down upon this squalid but settlement the imperishable lineaments of the Parthenon.

### ORDERLY EXCHANGE WELCOMED BY BOTH COUNTRIES

And now Lausanne came to the relief with a document, signed on January 30, 1923, entitled, "A Convention concerning the exchange of Greek and Turkish populations." It had come about by Greece's insistence that Turkey must accept the 450,000 Moslems resident in the Hellenic Kingdom in order to make room for the former's million or more refugees.

Further argument stressed the point that the hardships attendant upon such an exchange would be far less than would result in the way of postwar bitterness against the respective minorities if nothing were done.

Greece welcomed the Exchange as an economic necessity.

Photograph by C. D. Morris

GHOULS FISHING FOR BODIES AFTER THE SMYRNA DISASTER (SEE TEXT, PAGE 539)

Due to panic and enormous pressure, many people on the quay were either pushed overboard or committed suicide. Hundreds of corpses could be seen through the remarkably clear water of Smyrna Gulf, and youthful Turks fished them up with pieces of wire, for the purpose of loot.

© E. J. Hardcastle

RUINED SMYRNA: A PHOTOGRAPH TAKEN ONE YEAR AFTER THE DISASTER

Under the Turkish occupation of Smyrna no cameras were permitted to be carried ashore; hence the photographer made the snapshot from shipboard.

Photograph by C. D. Morris

THE TYPE OF FIRE-FIGHTING EQUIPMENT WHICH WAS CALLED UPON TO COPE WITH THE SMYRNA CONFLAGRATION

This is the kind of outfit which may be seen in Constantinople to-day.

Photograph by Lex W. Kluttz

REFUGEES ARRIVING AT PIRÆUS, PORT OF ATHENS, FROM SMYRNA

Photograph by C. D. Morris

A GREEK GRANDMOTHER AND BABY

A familiar sight among the transferred peoples was that of the old grandmother looking after the babies, the parents having died either in the Smyrna fire or from hardships connected with the long trip through Asia Minor.

Turkey also welcomed the Exchange as an economic necessity, though in quite a different sense. For two and a half centuries her Crescent had been diminishing toward eclipse. During the last hundred years she had relinquished rule over the peoples of twenty wide-flung territories. Within the last thirty years her area had shrunk from 1,500,000 to less than 350,000 square miles, and her population from 38,750,000 to 5,000,000. Yet she favored, and had in great part enforced, the complete withdrawal of non-Moslems from Asia Minor. Why was this?

It meant that the old régime, whereby foreign races had lived within her borders under religious toleration, accumulating much of the wealth, yet never becoming part of the social organism, had failed. So Turkey would clean house. She would apply the radical remedy of eliminating several millions, representing her wealth and commerce, and would build up from her own people corresponding elements wherewith to form a Turkish middle class as the center of a homogeneous Turkish nation.

In this sense the Exchange was for her, as for Greece, an economic necessity. Here is an historical milestone on Turkey-in-Europe's long road of 1453–1923.

No less is the Exchange Convention an international milestone. It has its predecessors in population exchanges between the Turks and Bulgars in 1913, and between the Bulgars and Greeks in 1919, but differs from these in being compulsory and, moreover, in being conducted under the auspices of the League of Nations. Its essential clauses provide:

> As from May 1st, 1923, a compulsory exchange of Turkish nationals of the Greek Orthodox religion, with Greek nationals of the Moslem religion—this to be retroactively inclusive of all Greeks and Moslems who had already emigrated at any time since October, 1912.
>
> Movable property in their homes, mosques, churches, schools, convents or hospitals to be taken away tax-free by the emigrants; their immovable and abandoned property to be inventoried, valued and liquidated by the Mixed Commis-

Photograph by Lee W. Kluttz

ARRIVAL OF REFUGEES AT SALONIKI AFTER THE SMYRNA FIRE

Four and a half months after the Smyrna holocaust there were 110,000 refugees in Saloniki, thus nearly doubling its population. There was a crisscross movement of refugees here, one group coming from western Thrace, the other from Anatolia (see page 587, and text, page 590).

Photograph by C. D. Morris

SAMSUN REFUGEES AT PATRAS, GREECE, STARTING FOR THE INTERIOR

Many of these Asia Minor refugees from the Black Sea port have found work among the currant vineyards and olive groves of the Peloponnesus, of which Patras, fourth city of Greece, is the chief seaport.

Photograph by G. L. Berry

REFUGEES FROM ASIA MINOR AND THRACE AT THE PORTALS OF THE OLD PALACE: ATHENS

Those who were registered received here, prior to January 1, 1923, the government's daily dole of two drachmas (about three cents).

sion—this liquidation process to be retroactive in respect to the property of Greeks and Moslems who had already emigrated at any time since October, 1912.

The Mixed Commission to consist of two Turks, two Greeks, and three nationals of countries neutral in the World War, the three to be chosen by the League of Nations;

Each emigrant to receive, in principle, property equi-valuable to that relinquished; the total value of relinquished properties to form government debts as between Turkey and Greece; the creditor country—a final balance having been struck—to receive from the other a settlement in part cash, in part interest-bearing certificates;

No obstacles to be raised or adverse pressure exercised or taxes imposed in respect to the emigrant; exempted peoples to be free to emigrate if they so wish;

Exempted peoples to include (*a*) Greeks established at Constantinople prior to October 30th, 1918, and (*b*) the Moslem inhabitants of West Thrace.

The exemption clause, which renders the Exchange incomplete to the extent of 635,000 people, sprang out of the liquidation difficulties which would be involved in the case of the Constantinople Greeks, whose abandoned properties would have amounted to many millions of dollars; hence the compromise permitting these and the West Thracian Moslems to remain undisturbed.

In practice, the temporary crisis which arose from differing constructions of the phrase "established at Constantinople" seems on the way of solution by the voluntary departure of large numbers of Greeks from the Turkish capital.

### STROKE OF THE PEN EXILES 3,000,000 PEOPLE

It is safe to say that history does not contain a more extraordinary document. Never before in the world's long pageant of folk-wanderings have 2,000,000 people—and certainly no less than 3,000,000 if the retroactive clause is possible of complete application—been exiled and readopted by a stroke of the pen.

Photograph by Harry Drucker

A REFUGEE WOMAN AT HER MAKESHIFT DRESSING TABLE: ATHENS

Note the whitewashed "balustrade" and the scrubbing brush, which now does duty as a hairbrush.

Even if regarded as a voluntary trek instead of a compulsory exchange, the movement would be without parallel in the history of emigration. The Klondike gold-rush peaked to only 22,000 in the year 1900, while that in California drew no more than 370,000 thither in 12 years. Dealing with immigrant masses of about 1,500,000 each, the Irish movement took 7 years, the Polish movement 10 years, and the Jewish movement 10 years, to land that number of their respective nationals in the United States. The highest human tide that ever reached our shores in one year (1907) was less than the Greek-Turkish shift by 750,000 people.

One might perhaps add that history has never produced a document more difficult of execution. It was to lessen these difficulties that exchangeability was based on religion and not race.

Due to five centuries of Turkish domination in Greece, the complexities in determining an individual's racial status are often such as would make a census taker weep. Here, for example, is a little problem which the Red Queen would have relished putting to Alice:

If certain Moslems in the Province of Epirus were descended from Greek Epirotes; if they embraced Islam in the 17th century; if they speak Albanian, yet are politically sympathetic toward Greece except in Albanian-Turkish difficulties, when they invariably side with the Turks, then what's the answer?

We would not blame anyone who might reply, with Alicelike meekness, "I'm sure I don't know."

Of the machinery which was to handle these 2,000,000 people, one arm was the Mixed Commission, with 11 subcommissions presided over by 4 Danes, 3 Hollanders, 2 Swiss, 1 Norwegian, and 1 Swede; the Commission to sit at Constantinople, its subcommissions to function in Macedonia, West Thrace, Crete, and Asia Minor, in their work of handling 450,000 Moslems and the 150,000 Greeks still left in Anatolia.

The other arm, the Refugee Settlement Commission, with representatives at Saloniki and Athens, was charged with

CROWDS STUDYING THE BULLETIN BOARDS POSTED ON THE PALACE WALLS: ATHENS

Here distracted relatives sought for news of their loved ones, from whom they had been separated at the time of the debacle from Smyrna (see, also, illustration below).

Photographs by C. D. Morris

SEEKING THE NAMES OF HER LOST LOVED ONES: ATHENS

As a result of the destruction of Smyrna and the confusion of moving vast masses of people from Anatolia to Greece, a great number of families became separated. These bulletins, covering the lost and found, were posted daily at Athens.

Photograph by C. D. Morris

REFUGEES' TENTS IN THE FOREGROUND OF THE THESEION (SEE TEXT, PAGE 564): ATHENS

This magnificent temple, completed probably during the fifth century B. C., is the best-preserved edifice of the ancient Greek world.

settling all Greek refugees, including the 150,000 yet to arrive, upon lands assigned by the Greek Government, or otherwise in productive occupation.

### HARMONY PREVAILS DURING FIRST EXCHANGE

The Lausanne Treaty was not ratified until July, 1923. Two months later, with the official machinery not yet functioning and with a general cessation of agriculture pending the Exchange, both interested governments welcomed initiative action by Americans. During the week of October 15–21, under committees composed of Greek and Turkish officials, with field workers of the Near East Relief acting as neutral members, 8,000 Moslems were evacuated from Mitylene to Aivali, in Asia Minor, in exchange for the same number of Greeks, transported in Greek vessels from Samsun to Saloniki.

To everyone's surprise, this opening of the Exchange was effected with perfect harmony. The Moslem families, with their flocks and household goods, trekked to Mitylene's various ports, where small Turkish steamers were waiting. Taxes and passports were waived; minor offenders were released from prison; the women were even permitted to take with them their strings of gold coins (see Color Plate XV).

Believers in a traditional Hellenophobia-Turkophobia would have stared at the sight of the Mitylene Greeks spreading farewell meals for their departing

Photograph by Harry Drucker

THE GOLDEN HORSESHOE AT THE ROYAL OPERA HOUSE IN ATHENS AFTER THE SMYRNA DISASTER

The "box-holders" are refugees, who have set up housekeeping with all the goods and chattels which they could bring with them from the stricken metropolis of Asia Minor. Each box accommodates a family (see text, page 564).

Photograph by C. D. Morris

HER PLAYFELLOW IS ONE OF THE PALACE GUARDS IN ATHENS

This is one of the Evzones, highland troops of Greece, accounted the bravest among her soldiers.

neighbors, and later accompanying them to the quay, where Christians and Mohammedans, who for a lifetime had been plowing adjacently and even sharing occasional backgammon games at village cafés, embraced and parted with tears. Then, seated on their heaped-up baggage, with their flocks around them—the women weeping, the children hugging their pets, the graybearded *babas* all dignity, as is their wont—the Mitylene Moslems set forth for unknown Turkey.

At Aivali, their "Ellis Island" of entry, interpreters speaking the familiar Greek and the unfamiliar Turkish installed them temporarily in waiting houses. Later they were distributed throughout the country according to trades and subject to a Turkish regulation limiting any village's increase, under the Exchange, to one-fifth of the population. While the family unit was preserved, the Mitylene communities were dissolved forever.

### MOSLEMS CAMP FOR TWO MONTHS AT SALONIKI

In November the Refugee Settlement Commission began its program in Greece. A month later the Mixed Commission's branches were preparing lists of exchangeable Moslems, filling out their declarations of property values, and supervising their transportation; for by agreement, in consequence of Greece's glut of refugees, evacuation of the Moslems was to precede by six months that of the Anatolian Greeks.

The principle of first-come-first-served did not advantage the initial rush of Macedonian Moslems for the seaboard. Surrounded by their household goods, they camped on Saloniki's bleak quay for two months while waiting for the Turkish exchange ships to arrive. There were no schedules, and delays of a mere month or so counted as nothing on these voyages into the unknown.

Not until Greece's shores had faded into a blue blur would the skipper open his sealed orders and announce the port of destination. It might be anywhere along 2,000 miles of Asian coast. Whether one liked that particular port or

not was of no consequence; and while one's passage was free, there were no return tickets on this voyage, which so aptly realized the poet's line, "What, without asking, whither hurried hence?"

Throughout a year Saloniki's long quay beheld the mournful pageant of departing Moslems. Had the shade of Mr. Gladstone been present to witness his fiat of half a century ago being realized, he must have softened at that picture of dignity in misfortune, the Turks going "out of Europe, bag and baggage."

Notwithstanding their new government's preparations to receive and care for them, many of the Moslems arriving in Asia Minor suffered even more than the exchanged Greeks. Some of the former found themselves in a war-devastated region, others in villages whose best houses had been preëmpted and whose poorer ones had been dismembered for firewood by those who had remained behind after the flight of the Greeks.

Unreckoned tens of thousands died by malaria or exposure, while multitudes of disillusioned families declined the second-hand pick of farms offered them and became wanderers. To the question, "Where are you bound for?" addressed to ox-drawn caravans roaming through the land, the answer would be, "We are looking for a tobacco field as good as ours at Drama," or, perhaps, "an olive grove like our old one on Mitylene."

Photograph by S. R. Vinton

A GREEK MOTHER AND HER BABY

Among the Macedonian refugees, hammocks were very commonly used instead of cribs.

By May 1, 1924, 250,000 Moslems had been evacuated; then the westbound flow of 150,000 Greeks set in, these moving simultaneously with the remaining 200,000 Moslems until, eight months later, the Exchange was complete.

### LIFE MUST START AFRESH FOR 600,000

In this mechanized exiling of 600,000 souls the individual heartbreak was lost in the all-embracing swirl of things. Only here and there a glance, a gesture, a fragment of talk, revealed the undercurrents of this great Christian-Moslem drama.

Many a grayhaired shopkeeper beheld his lifelong customers dispersed, himself

Photograph by C. D. Morris

THE AMERICAN QUARANTINE STATION ON MAKRONISI ISLAND, GREECE, FEEDING 6,000 GREEK REFUGEES FROM TREBIZOND, BLACK SEA PORT, WHO HAVE JUST ARRIVED BY STEAMER (SEE TEXT, PAGE 563)

starting life afresh. And the old and honored public scribe—what use now his little writing box and literary flourishes, since his mother tongue would be as naught in yonder land of an alien speech?

Many a village Evangeline and her parted lover would vainly seek each other in Greece's mountain-barred valleys or in widespread Anatolia.

Here a child sobbed for a lost pet, and there a grandmother wept at the thought of some tiny hill-topping cemetery henceforth abandoned to weeds and forgetfulness.

And few were the congregations who listened dry-eyed to their pastor's last sermon, or who without deep emotion fell in line outside the door of their dismantled church to follow in the wake of priest and sacred emblems down to the waiting ships.

### COMMISSION IS ADOPTED FATHER OF 1,136,600 IMMIGRANTS

Striking a fresh balance sheet early in 1924 and including therein the exchanged Greeks still to come, the Refugee Settlement Commission found itself to be the officially adoptive father of 1,136,600 immigrants, of whom three-fifths were agriculturists. Against this tremendous debit the Commission held in Macedonia and West Thrace state-transferred lands totaling 1,250,000 acres, for colonization purposes and as loan guarantees.

Photograph by C. D. Morris

A WOMAN OF THE ENVIRONS OF CONSTANTINOPLE THRESHING GRAIN

When news spread of the withdrawal of Greek troops from the "backyard" of Constantinople (Thrace), Greek farmers were seized with panic and fled precipitately, leaving their ripening harvests ungathered in the fields (see text, page 540).

Photograph by Thomas Mills

THE GUARDED BREAD LINE, SOURCE OF SUPPLY IN CONSTANTINOPLE

Photograph by S. R. Vinton

REFUGEES HOLDING UP TICKETS ENTITLING THEM TO PARTICIPATE IN THE DISTRIBUTION OF OLD CLOTHES

A scene at the headquarters of one of the American relief organizations at Saloniki.

Photograph by C. D. Morris

A STREET SCENE IN A THRACIAN VILLAGE

According to a Moslem superstition, oxhorns bring good luck (see the upper right corner of the illustration).

These were pledged as against temporary financial advances until the Refugee Settlement Loan, subscribed at Athens, London, and New York, placed $50,000,000 at the Commission's disposal.

If Hellas could call back her ancient gods and press them into service, Hercules of the Twelve Labors would certainly balk at the Commission's yet-unfinished task of integrating a million or more of Greece's distant kinsfolk into her economic fabric. Colonization had to start from the ground up, with surveying and motor plowing, for neither land maps nor boundaries existed in Macedonia, and the soil had been so long untilled that animal power was insufficient to break it. Whether it was a question of houses, plows, draft animals, or grain, the Commission, when supplying its gigantic family, had to think in terms of hundreds of thousands. Often when houses were not forthcoming from abandoned Moslem properties, the colonists, as artisans on the Commission's payroll, erected their own dwellings out of stone, brick, or mud-plastered wattles, according to what the land offered (see page 583).

The undrained, mosquito-breeding marshes brought malaria, and the Gargantuan family had to be dosed with 15 tons of quinine. Drought came, and 50,000 cultivators must be rehabilitated with a $1,000,000 worth of grain and forage. Any misfortune always struck wholesale—a thousandfold magnification of how measles will run through an entire household of children.

Meantime the Commission's civic work of settling the city dwellers, on the basis

Photograph by C. D. Morris

"BREAD! BREAD! BREAD!"

These are Greek civilian prisoners, released by the Turks after more than a year. During the war there had been taking of hostages on a large scale by both sides. The situation remained at a deadlock for a year after hostilities had been concluded. Then American organizations undertook an unofficial negotiation of exchange of prisoners, this being afterward followed by the appointment of committees by the League of Nations for that purpose (see text, page 564).

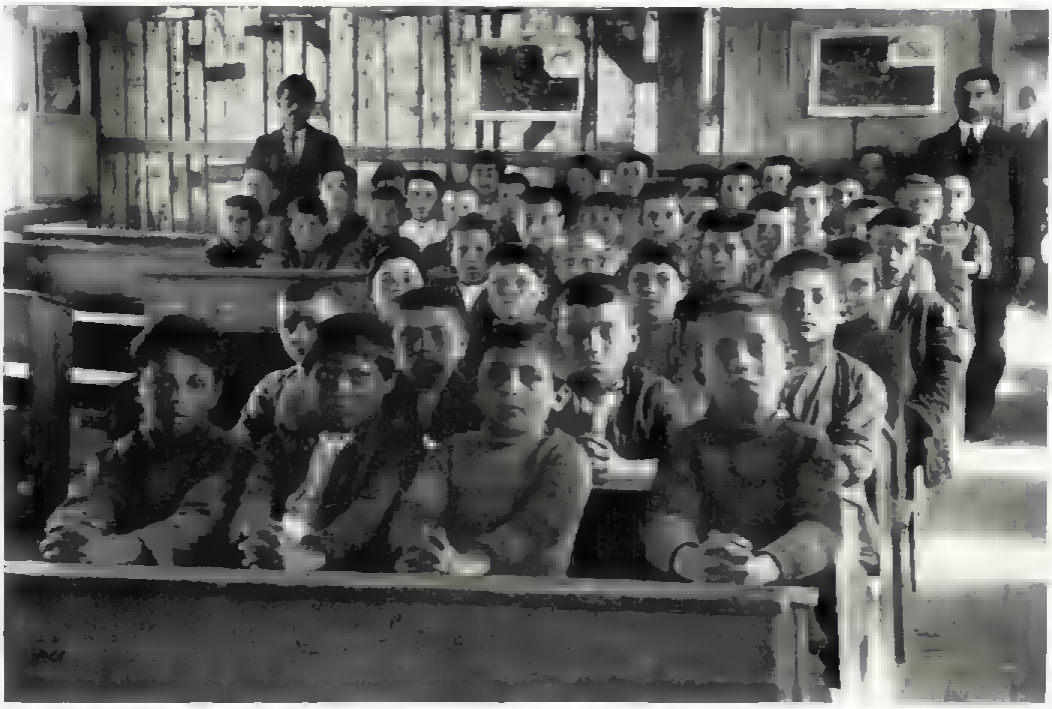
Photograph by Harry Drucker

READY FOR A SECOND HELPING

Refugee children on the Island of Syra, the commercial center of the Cyclades. The capital of the island, Hermopolis, owes its founding to an earlier influx of refugees—those from Chios and Ipsara, who settled here after the devastation of their island homes, in 1821-22.

Photograph by Carris E. Mills

A CARAVAN OF CHRISTIAN REFUGEES TRAVELING TO A RELIEF FARM NEAR RODOSTO



Photograph by S. R. Vinton

A CAMP SCHOOL FOR CHILDREN OF REFUGEES AT SALONIKI

The Anatolian Greeks, exiles for many centuries from their native land, spoke a tongue different from that spoken by the Greek proper. Therefore the first duty of the Greek Government was to teach Anatolian Greeks to speak Greek.

Photograph by H. C. Jaquith

THE TYPE OF REFUGEE HOMES BUILT BY THE GREEK GOVERNMENT IN THRACE

Photograph by C. D. Morris

CHILDREN MAKING BRICKS AT RODOSTO, ON THE SEA OF MARMORA

Immediately upon emerging from tent life (see illustration, page 586), the transferred peoples began to utilize the local clay and build themselves houses (see text, page 564).

Photograph by C. D. Morris

AN OPEN-AIR BARBER SHOP FOR REFUGEES IN RODOSTO

of two rooms to a family, went on in those stucco suburbs, which eventually will change the appearance of every major city in Greece. The urbans, with their racial instinct for trade, performed wonders in the way of self-rehabilitation, and before long they were paying nominal room rentals and bidding competitively on shop rentals, with the Commission as landlord.

The Commission will continue in its part-paternal, part-directorial, part-creditor function—accepting debit slips against agricultural supplies, occasionally financing some new trade, and always with permanent colonization as its goal—until such a time as the final settling up occurs between the two governments, several million people, and itself, and the books of the Exchange are closed with a red line.

### GREECE, WITH ONE-FIFTH TURKEY'S AREA, HAS 1,500,000 MORE PEOPLE

Meanwhile, one may perhaps strike a trial balance of results. Turkey, now about one-fourth larger than Texas, is left with a population of 5,000,000, of whom four-fifths are Turks. Her naturally rich, but undeveloped, territory contains only 15 people to the square mile, yet at last she has a national homogeneity upon which to base her future. Except for the Constantinople Greeks, whose fate lies with the League of Nations, her religious and racial minority problems have been wiped out; she herself has sponged the slate.

Greece, with less than one-fifth of Turkey's area, emerges with a population exceeding the latter's for the first time by 1,500,000 people and averaging 123 to the square mile.

### HISTORY'S GREATEST TREK HAS COST 300,000 LIVES

If the last traces of classic Ionia have vanished from Asia, the motherland, in receiving back the descendants of her Pilgrim Fathers after three thousand years, acquires a sturdy, invigorating stock of grain producers and, moreover, of industry transplanters, who have brought with them the crafts of silk-weaving, rug-making, and ceramics.

As to the cost of history's greatest trek, conservative estimates place it at 300,000 lives lost by disease and expo-

COPYING A RUG DESIGN

Among other results of the transfer of Greeks from Asia Minor to Greece is that the traditional arts and crafts of these people, such as rug-weaving, are now taking root for the first time on the mainland of Greece.

Photographs by Harry Drucker

GREEK GIRLS WEAVING RUGS

This is one of the trades that is now being imported into Greece from Asia Minor as a result of the transfer of populations (see text, pages 564 and 584).

REFUGEES CROSSING THE MARITZA ON A RAFT PULLED BY ROPES

Photographs by Frank America

A TENTED CITY ON THE MARITZA RIVER

Here tens of thousands of Greeks camped after having fled from Thrace before the incoming Turks (see text, page 557).

HOUSEKEEPING IN THE REFUGEE BARRACKS AT SALONIKI

Photographs by S. R. Vinton

INTERIOR OF A GREEK REFUGEE CAMP IN MACEDONIA

The refugees themselves partition off the extremely limited space by building low walls around each family (see, also, text, page 559).

Photograph by Lex W. Kluttz

THE LOSS OF THREE SONS IS WRITTEN IN HIS FURROWED FACE

He is one of the deportees from Greece, his former home being Mitylene, his present abiding place Adalia.

Photograph by S. R. Vinton

AN ANATOLIAN GREEK REFUGEE GIRL

Her eyes show that she has seen horrors more awful than even the imagination of ancient Greek dramatists could conjure up.

Photograph by Frank America

THEY HAVE NOT WHERE TO LAY THEIR HEADS

These exiled mothers and their babies are Anatolian Greeks. The photograph of the mother at the left was taken before her departure from eastern Asia Minor; those at the right, after their arrival in Thrace.

sure and at an expenditure mounting beyond $100,000,000.

By the winter of 1924 the human tidal waves of two years' duration had subsided. One could walk along the Near East's sea frontages, as after some great storm, and note the changes wrought. There was Saloniki, its quay lined with crescent-curved sailing craft, archaic as Troy, with their final quotas of exchangees; the last-arriving Greek boys staring broadly at the last-departing Moslem boys, speech between them being impossible, since the Greeks spoke only Turkish and the Turks spoke only Greek; the ramshackle, burned-out city already sprouting into cement suburbs for housing 25,000 Greeks, and the business-as-usual proclivities of Giorgios or Demetrius being everywhere visible, even though it be only nuts and oranges atop a packing box on the dingy midway of tented refugeedom.

And there was Kavala, its tangled streets haunted by the white ghosts of deserted minarets; its tobacco warehouses unloading their glut of temporarily sheltered immigrants in exchange for the crop of 40,000 farmer colonists. The latest arrivals camped in wild valleys pierced by the ancient Roman road. Here, with tents, bedding, grain, frost, and fresh air as the extent of their mixed blessings, they seemed marvelously cheery and progressive, with their bake ovens consisting of rock-paved holes in the hillside, a grocery store created out of mud-plastered reeds and a case of spaghetti, and even a hand-carpentered bench with a coffee machine and a bottle of *douzicko* on top of a dry-goods box, as the makings of an embryo café.

### CONSTANTINOPLE, STILL GLORIOUS BUT FADED

And Constantinople—still glorious, yet a bit faded and shorn; her harbor almost deserted, her Greek quarter fast diminishing, her foreign embassies preparing for transference to Angora, and, above all, her Sultanate and Caliphate abolished by Republicanism, and her last royal seraglio gone, like the poisoned cup and secret bowstring, down the dusty centuries. For so long the peerless mistress of conquerors and poets, to-day she seems wondering if she hadn't better remove the rouge, let out the lacings, and grow old gracefully into a museum.

And Athens—somewhat out at the heels from financial overstrain, somewhat bare, as after the passage of locusts; her port swarming with commerce as are her suburbs with 60,000 immigrant citizens housed in stucco settlements; her English poet sympathizer memorialized in the Byron Settlement, where Missolonghi Square leads one to Anatolian Greeks weaving in Tom Moore Street or rug-knotting in Maid of Athens Street; her sky-framed Parthenon looking down on these by-products of the 1922–1924 drama, a drama so strange, so moving, that only Greece's classic poets could have interpreted it—Sophocles, perhaps, querying the enigma of human suffering in a tragedy called "The Exchanged."

The solution to that enigma, as it relates to the Exchange, was, perhaps, personified in an ancient, grizzled, square-capped Greek fisherman who knelt one morning on the shore of a little Peloponnesian harbor, painting a name on the stern of a boat. He had abandoned his own craft in some Asian village during the Exchange, and a storm had beached this rudderless, fish-smeared derelict near his hut. He had wiped out the old blood-stains and refitted her for his fresh start in life.

The name that he painted, while kneeling there on the seashore under the Ægean's glowing dawn, was *The New Hope*.

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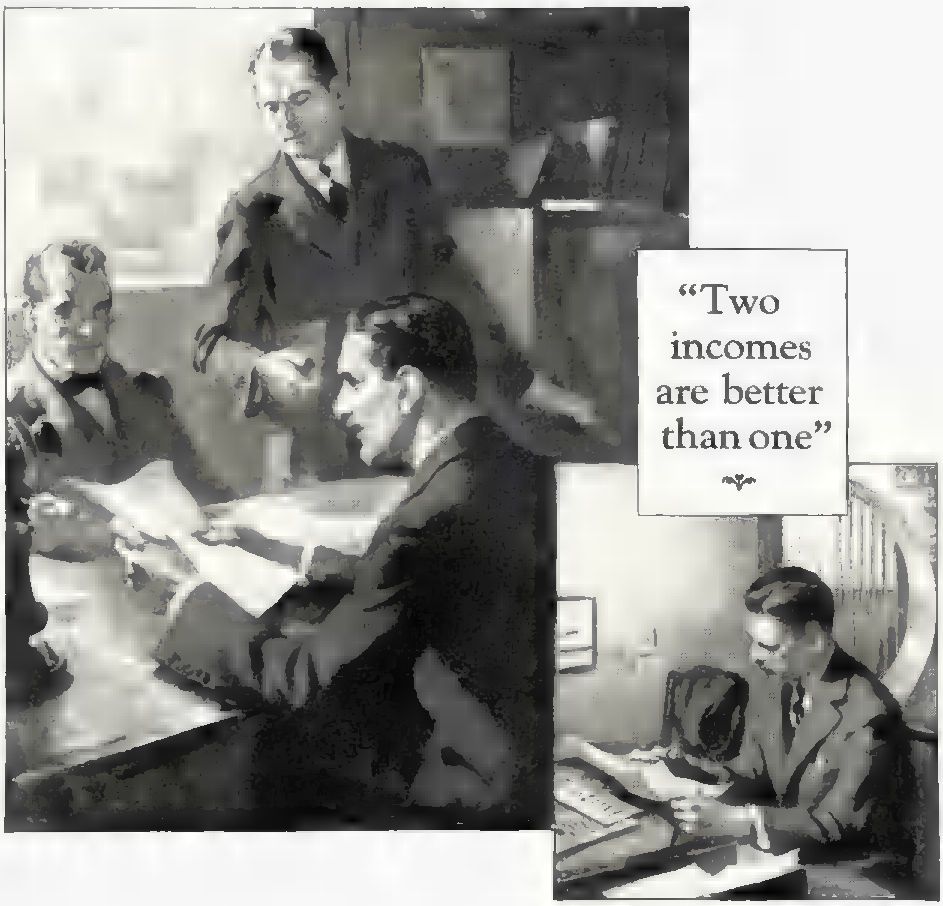


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**—it prevents face-shine**
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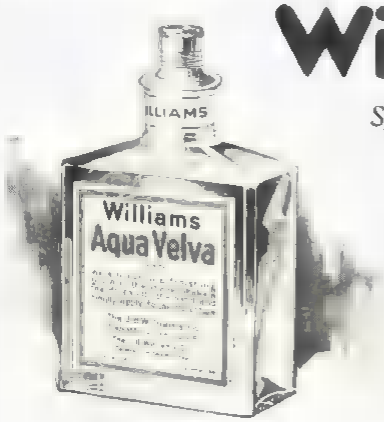


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Nat'l Geo. 11-26

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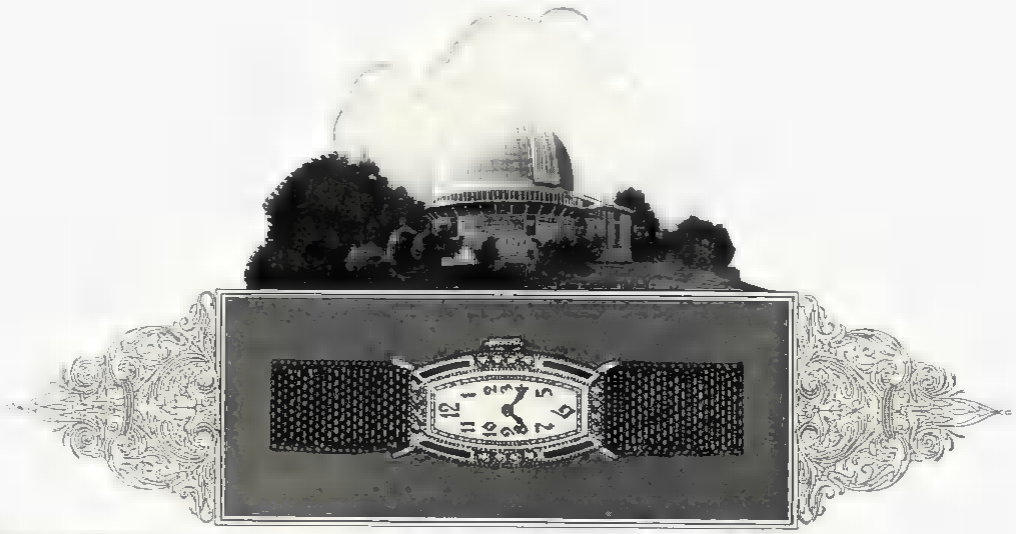

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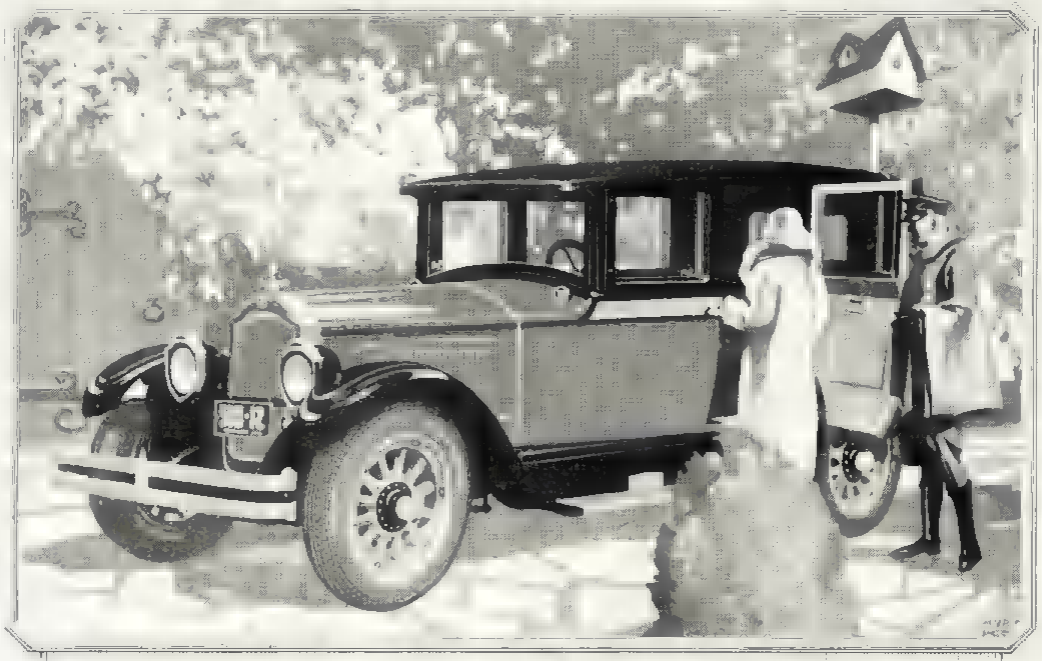

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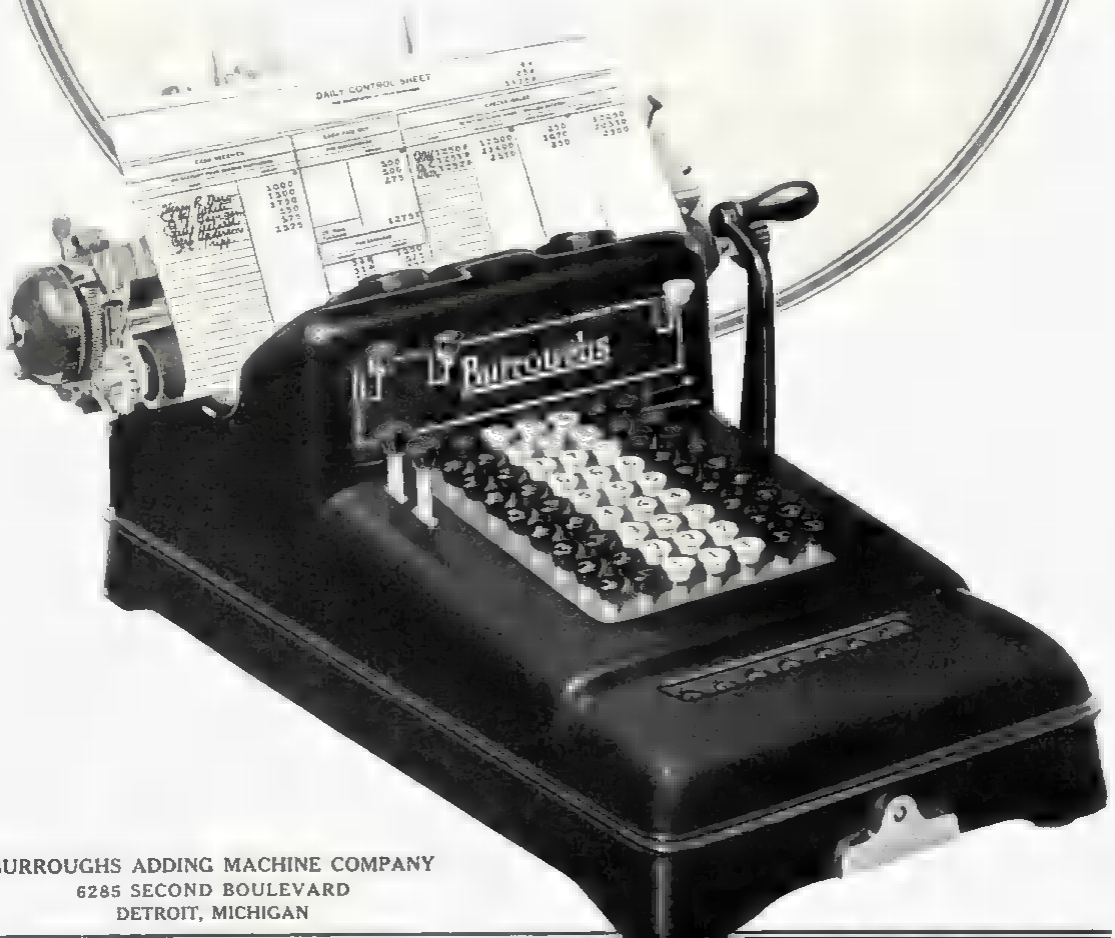


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What a big part links play in a man's attire! Because of their importance to the well dressed man he receives many as gifts. You can be sure that those you give are distinctive by selecting Krementz. For their quality is so fine, the construction so sturdy that each pair is guaranteed to wear a *lifetime*. Not only are the designs pleasing—they are exclusive with Krementz links. The name Krementz is stamped on the back of each. Ask any of the finer shops catering to the wants of the well dressed man, —they know!

*Write for folder of new designs.*

Beautiful blue leatherette, richly lined gift boxes 50c extra.

Krementz
COLLAR BUTTON
Newark New Jersey

# DODGE BROTHERS
## SPECIAL
# COACH

A recent reduction in price is not the only advantage to be considered.

The Coach protects children against open rear doors. It affords exceptional vision on all sides. It provides an intimate and yet roomy interior.

In the Special type, it carries complete special equipment, including nickeled front and rear bumpers, nickeled radiator shell, steel disc wheels, motometer with lock, rear vision mirror, scuff plates, cowl lights and smart special body striping—a striking closed car value.

# *Oyster dressing gives the turkey a rare flavor*

**RECIPE**

Pour boiling water over 4 quarts of stale bread crumbs. Let steam, then drain off. Add 2 well-beaten eggs, 4 tablespoonfuls of butter, salt, pepper. Then add 1 quart of Oysters. Season with sage, if desired.

Luscious Oysters on the half-shell, or the delicious hot ones, help break the monotony of Autumn or Winter Day Menus.

For the Meal-of-the-Day, a crisp, brown Oyster Fry, heavily coated with cracker crumbs, in a luring setting of green lettuce, is unexcelled.

Steamed Oysters, oozing with seasoning, provide a repast that is irresistible.

Government experts have found 98 ways to easily prepare this health-giving sea delicacy. Mail coupon for Free Booklet: "Oysters: An Important Health Food."

**Oysters are**

1 **easily digested**
2 **—self-sufficient as a diet**
3 **rich in Vitamin C, an essential food element**
4 **200 times stronger in Iodine content than Milk or Eggs**
5 **—nourishing, but non-fattening**

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**U. S. Bureau of Fisheries, Washington, D. C.**
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Oyster Growers & Dealers Ass'n,
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Please mail me Free Booklet, "98 Ways to Prepare Oysters," or "Oysters: An Important Health Food."

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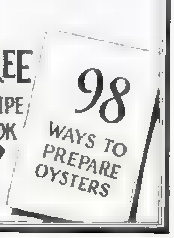


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SAFETY Gillette RAZOR

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*The Gillette Bostonian*
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*Whether you have a beard "like wire" or as soft as silk, your* GOOD *shave will become a* PERFECT *shave if you read "Three Reasons" a new shaving booklet just published. A postcard request and we'll gladly send you a copy with our compliments.*

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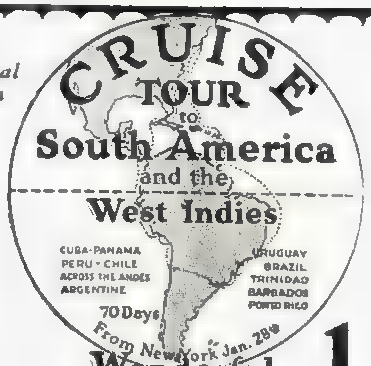


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*A pleasure cruise exceeding every expectation—Luxurious comfort, perfect service, enjoyable entertainment, on board the "Rotterdam." Scenic splendor, strange and thrilling sights in interesting Old World lands.*

**By the famous "ROTTERDAM"**
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Under the HOLLAND-AMERICA LINE's own management

**"The ROTTERDAM"**
**24,170 tons register, 37,190 tons displacement**
Has a world-wide reputation for the magnificence and comfort of her appointments, the surpassing excellence of her cuisine and the high standards of service and management on board.

**67 Days of Delightful Diversion**
**ITINERARY includes Madeira, Lisbon, Cadiz, Seville, Gibraltar, Algiers, Tunis, Athens, Constantinople, the Holy Land and Egypt, Italy and the Riviera.** Carefully planned Shore Excursions. Stopover in Europe.

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37 days
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*Or any Steamship Agent*

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THE chauffeur-driven car, in spite of wear or weather, always looks well groomed... because the finish is given constant care.

Your automobile, finished with Duco, needs but little attention to look its brightest and best under every condition.

Down years of weathered roads, it will hold its first sparkling newness.

*New or old, your car deserves* DUCO. *Insist upon the genuine*

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DU PONT

*There is only ONE Duco — DU PONT Duco*

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Tucson, garden city of Arizona, bids you come this winter.

Boundless stretches of open country, skies that are blue, days brilliant beyond compare await you here.

### *Send for Booklet*

Now, while this invitation is before you, take the first step toward coming to Tucson—fill in the coupon and mail it today.

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Mail the coupon today.

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# ARIZONA

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504 Old Pueblo Bldg., Tucson, Arizona.
Please send me your free book, "Man-Building in the Sunshine-Climate."

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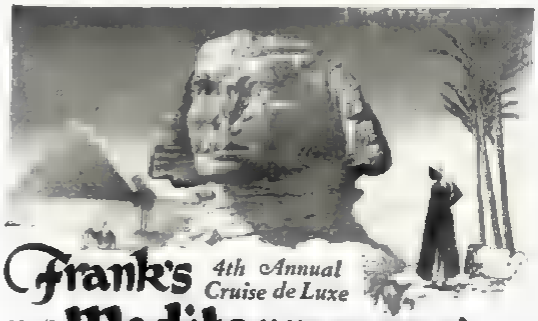

# Frank's *4th Annual Cruise de Luxe* TO THE Mediterranean
## Egypt—Palestine

**Madeira, Spain, Gibraltar, Algiers, Tunis, Constantinople, Greece, Italy, Sicily, Riviera, Monte Carlo, France, England.**

(Limited to [redacted] Guests—less than Half Capacity)
By Specially Chartered Magnificent New 20,000-Ton

## Cunard S. S. "Scythia"

Sailing from New York January 26—67 days

The Cruise of the "Scythia" has become an annual classic. In every respect it is unsurpassed. Prearranged shore excursions at every port included in the rate. Finest hotels and the best of everything. Unusually long stay, at the height of the season, in Egypt and Palestine.

Stop-over privilege in Europe without extra cost, returning via S. S. "Aquitania," "Mauretania," "Berengaria," or any Cunard Line Steamer.

Luxury Cruise to WEST INDIES, February 18—27 days—by Palatial Holland-America Line Steamer "VEENDAM"

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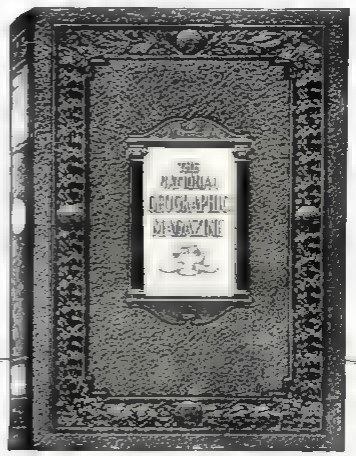


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## The Mart of the Six Million

THAT is New York. Those two humming, enchanting, bewildering streams of people converging at Madison Square—they are Broadway and Fifth Avenue. And here at the crossing of the city's great thoroughfares is the meeting place of many businesses—The Fifth Avenue Building.

From its windows look merchants of great traffic through the world. Clothing which may be bought in Washington or Florida is handled through offices in this building. House-furnishings, perhaps from America or Europe, find their markets here. Laces, greeting cards, toys, paper, pottery, glassware, labels, blankets—these are only a few of the many trades in The Fifth Avenue Building.

Tenants enjoy the prestige of an address which is world-famous, 200 Fifth Avenue. For many decades The Fifth Avenue Hotel, a meeting place of fashion and cosmopolitan importance, stood here. Tenants enjoy pleasant offices and interesting surroundings—Madison Square across the way. They are in the midst of things, for it is only ten minutes by subway to the Pennsylvania Station. Thirteen minutes to the Grand Central. All uptown and downtown is as near, or nearer. Surface lines and busses pass the door. Two elevated lines are within two blocks.

New York, the mart of the six million, surely! This building, center of commercial dignity from whence buying and selling to that great market may be accomplished.

Broadway and Fifth Avenue at Madison Square, New York

*"More than an office building"*

# "The MAURETANIA"

## sails to EGYPT

## and the Mediterranean

### from New York Feb. 17, 1926

A fascinating Winter Cruise offering an unusually distinctive opportunity to all who intend to visit Mediterranean points, Egypt and the Holy Land next season.

*Travelling on this great, world-renowned Cunarder, you are assured of the right kind of environment plus the acme of comfort, luxury and service.*

*The Mauretania will call at Madeira, Gibraltar, Algiers, Villefranche (French Riviera), Naples, Athens, Haifa (Holy Land), Alexandria, etc. Many interesting and attractive shore excursions. Round-trip tickets via North Atlantic.*

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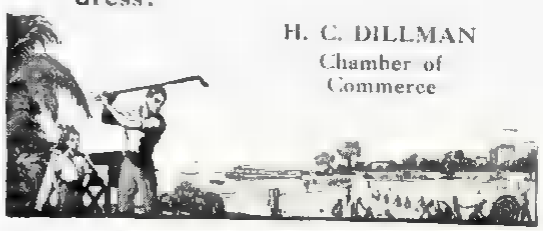

# When accident casts its shadow across *your* pay check

*An accident or lengthy illness. . . Income blotted out, or insufficient for soaring expenses. . . Doctors, nurses, medicine . . hospital charges, perhaps. . . Savings swallowed up . . debts . . sacrifices for the family . . worry . . fear! . . Protect yourself now against the day when accident or illness casts its shadow across* your *pay check.*

VITALLY needed pay checks from eleven million incomes were cut off last year by accidental injuries alone. Before the next twelve months have gone by, one man or woman in every three will lose precious time through accident or illness.

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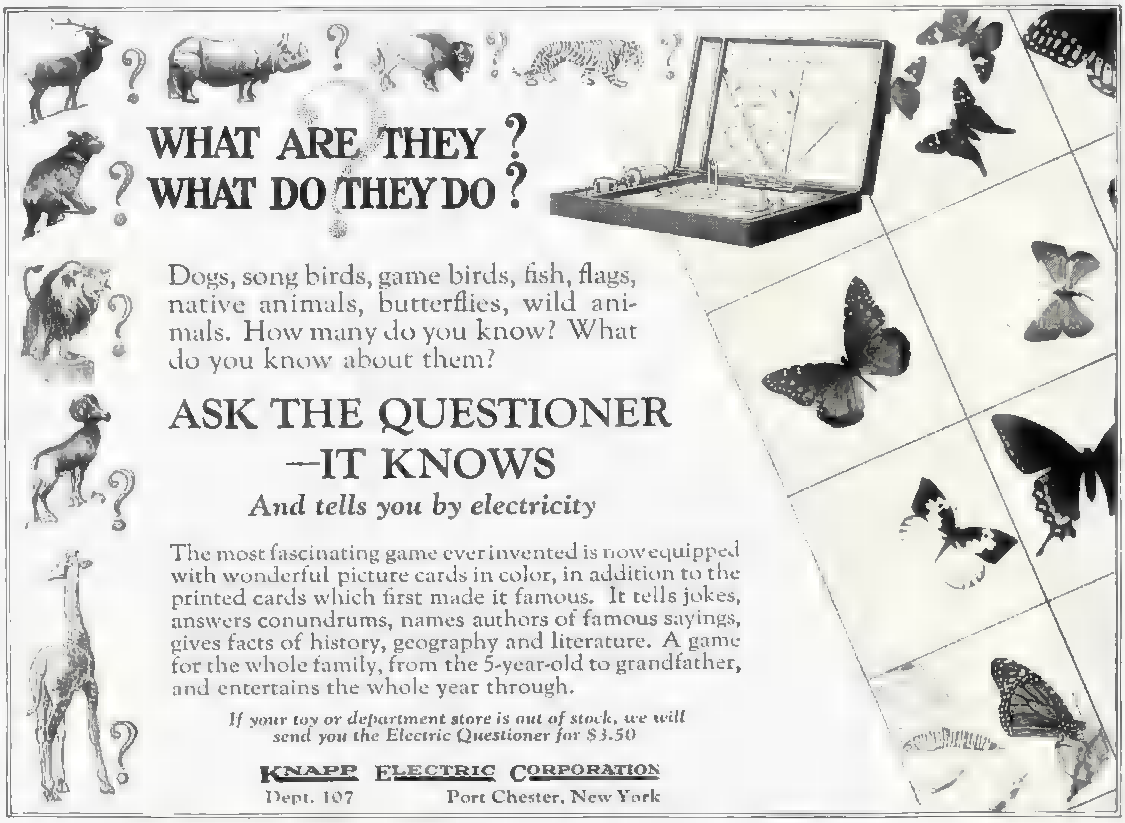
The Ætna-izer is a man worth knowing! He can give you dependable protection and sound insurance advice. The Ætna Life Insurance Company and affiliated companies are the strongest multiple-line insurance organization in the world. In this great organization you can find security for *all* your interests—Life Insurance in all its branches; Accident and Health, Automobile, Liability, Compensation, Burglary, Fire and Marine, Fidelity and Surety Bonds.

Ætna-ize! According to your needs! As you prosper and as your obligations increase!

**ÆTNA-IZE**

ÆTNA LIFE INSURANCE COMPANY AND AFFILIATED COMPANIES

*Ætna Casualty and Surety Co. Standard Fire Insurance Co. Automobile Insurance Co., of Hartford, Conn.*



# WHAT ARE THEY ?
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BABY GRAND

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McDonnell Memorials always express individuality—in an appropriate way. They are designed by artists with vision and sympathy, hewn from Barre granite, chiseled by craftsmen, placed with exacting care by our own experienced men.

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*Designed for American Face Brick Association*

*This house has just been built in Chicago by the Chicago Federation of Women's Organizations, in co-operation with "Better Homes in America," in its effort to stimulate better home building. Two years ago "Better Homes in America," of which Secretary Herbert Hoover is president, built the "Home Sweet Home" house in Washington, D. C.*

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THE many color tones and textures in Face Brick—the artistic effects possible with various bonds and mortar joints—give a varied beauty unapproached by any other building material. The savings of the Face Brick house in repairs, depreciation and painting, in insurance rates and heating costs, in a few years wipe out its slightly higher initial cost and make it the most economical to own. The facts are more fully detailed in "The Story of Brick."

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**They make unique gifts to one's relatives**

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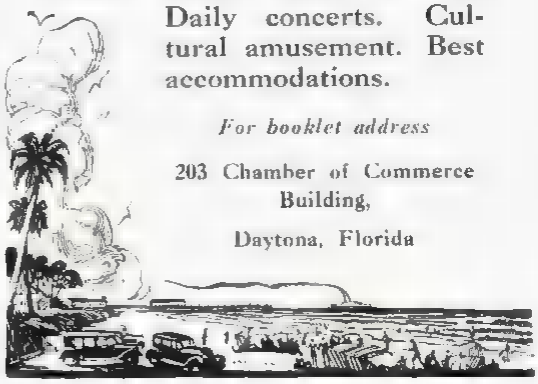

*For booklet address*

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## Nature puts the Bran in

# The New Pettijohn's

## WHOLE WHEAT CEREAL

## You don't have to add it

YOU have heard and read a lot about the value of *bran* in the diet of both children and adults.

Let us assume that you want the family to benefit by what you now know about bran—and come straight to the question: "What is the *best way* to give it to them?"

The Quaker Oats Company asks you to consider these facts about the New Pettijohn's—

The New Pettijohn's is the whole wheat. So it contains *all* the bran of the wheat. It is 25% bran, and this is *natural* bran. The bran is not added. It is there because *Nature* put it there.

The New Pettijohn's is a *delicious* food. So the family eats it because they *like* it—and gets the bran as something *good to eat*, not as a medicine.

The New Pettijohn's is more than bran. It is *food*. So fine a food that dietetic authority has no hesitation in saying that, "Eaten with milk, the New Pettijohn's fills *all* nutritive requirements of the human body, and is an *ideal food* for growing children."

The New Pettijohn's is a most *convenient* cereal food. It cooks *through* and *through* in 3 to 5 minutes, and comes to the breakfast table fresh, hot and appetizing.

*In brief*

**The New Pettijohn's is a delicious whole wheat food.**

**It contains 25% natural bran—with essential Vitamins and Mineral Salts.**

**With milk it forms what dietitians call a "perfect" food.**

**It cooks in 3 to 5 minutes.**

## The Quaker Oats Company

CHICAGO, U.S.A.

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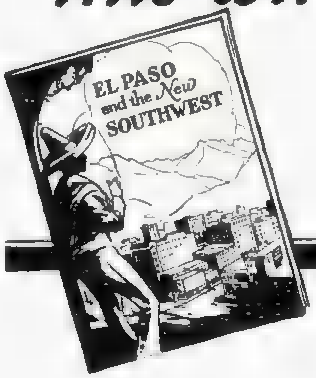


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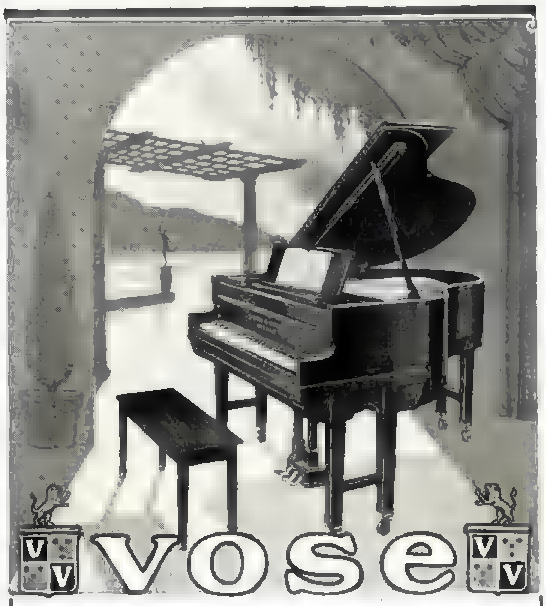


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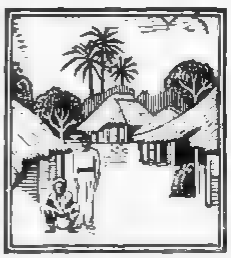

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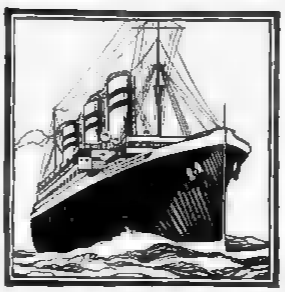

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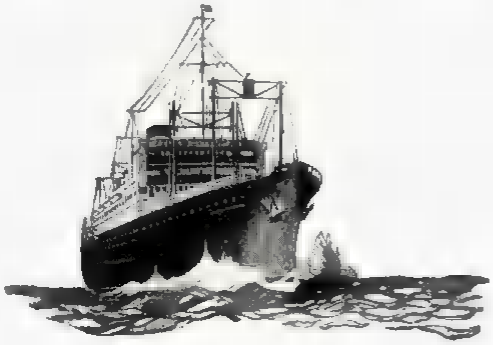

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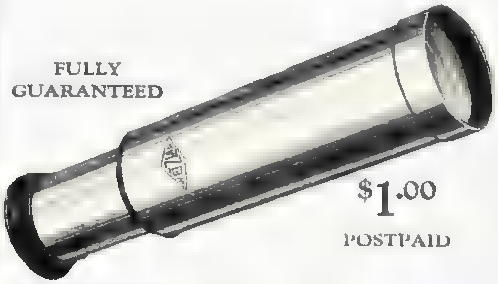

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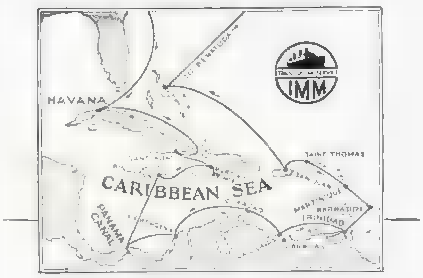


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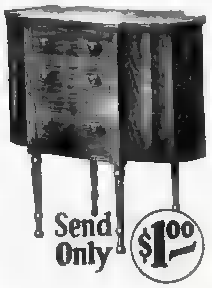


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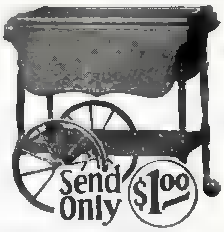


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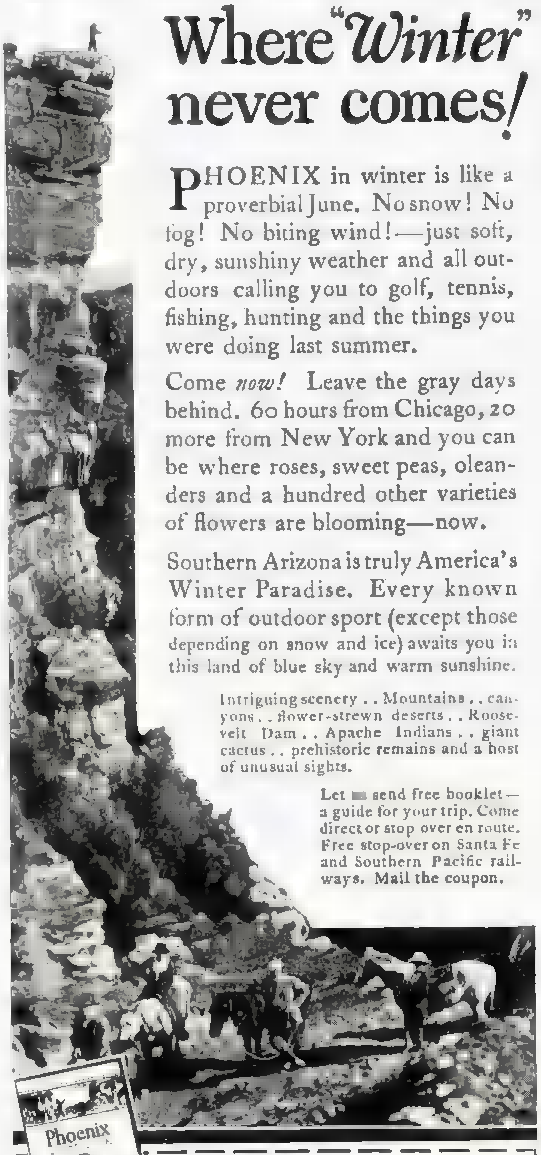

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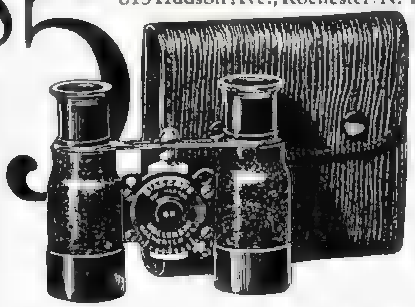

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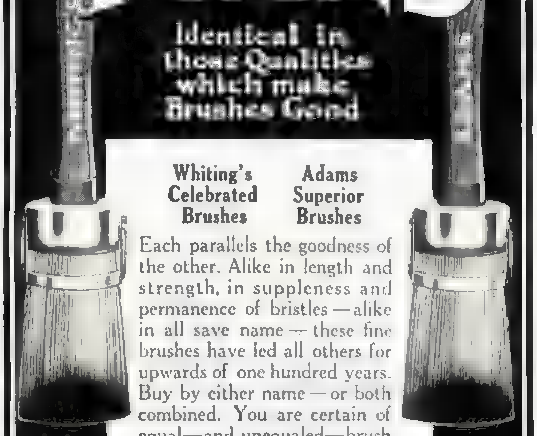

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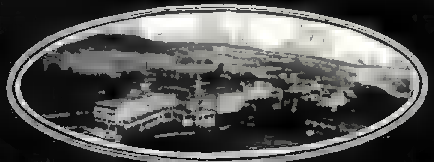

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## The New Erector

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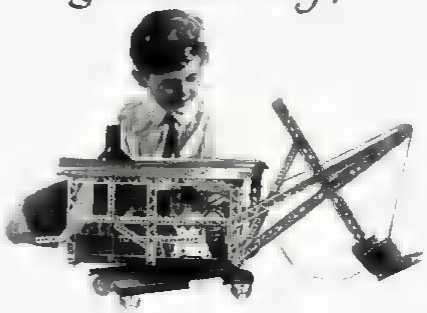

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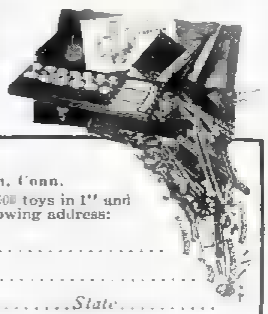

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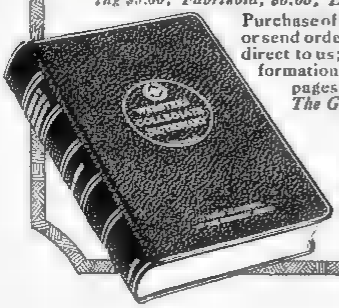

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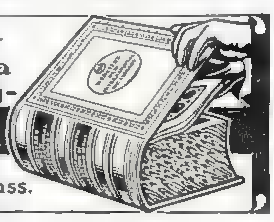

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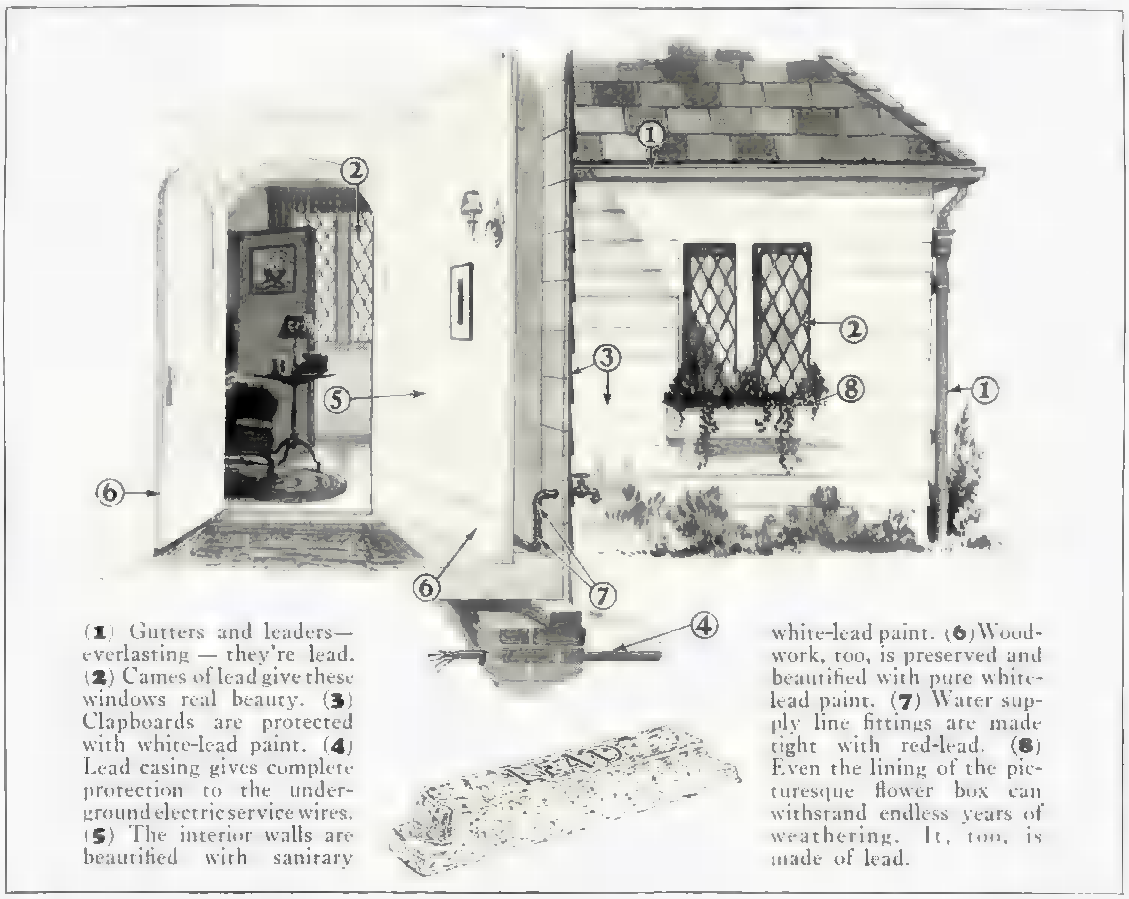


(**1**) Gutters and leaders—everlasting — they're lead. (**2**) Cames of lead give these windows real beauty. (**3**) Clapboards are protected with white-lead paint. (**4**) Lead casing gives complete protection to the underground electric service wires. (**5**) The interior walls are beautified with sanitary white-lead paint. (**6**) Woodwork, too, is preserved and beautified with pure white-lead paint. (**7**) Water supply line fittings are made tight with red-lead. (**8**) Even the lining of the picturesque flower box can withstand endless years of weathering. It, too, is made of lead.

# Four walls—a roof—and LEAD

CAN lead be turned into gold? Look at this picture. In it is the answer to the old alchemist's dream. For today man has done more than transform dull pigs of lead into so many glittering nuggets. In his effort to beautify and protect the four walls and roof of his home, he has discovered that lead is the more useful, and therefore gladly exchanges the gold for lead.

The hand-wrought gutters and leaders, for example, are not only beautiful, but weather can't wear them. They are made of lead. The old craftsmanship of the rustic casement windows will remain unchanged through the centuries. All the cames that hold the glass in place consist of lead.

Another form of lead, one in most general use today, is present in this home. It doesn't look like lead—yet it is made from lead and has the metal's superior qualities of endurance, weather resistance and protection.

You'll find it on the clapboards and trim—on the interior walls and woodwork. It is the basic carbonate of the metal, called white-lead, which makes a paint that gives both beauty and protection to the surface.

There are many other unseen uses of lead in this home. Lead helps to give the glass of the electric light bulbs their transparency, also the fine glass tableware its brilliancy. Lead is in the glaze of the chinaware and in that of the bathtub and sink. And a lead device makes it safe to telephone when lightnings play.

*National Lead Company makes lead products for practically every purpose for which lead is used today. If you would like to know more about this wonder metal of many uses, just write to our nearest branch.*

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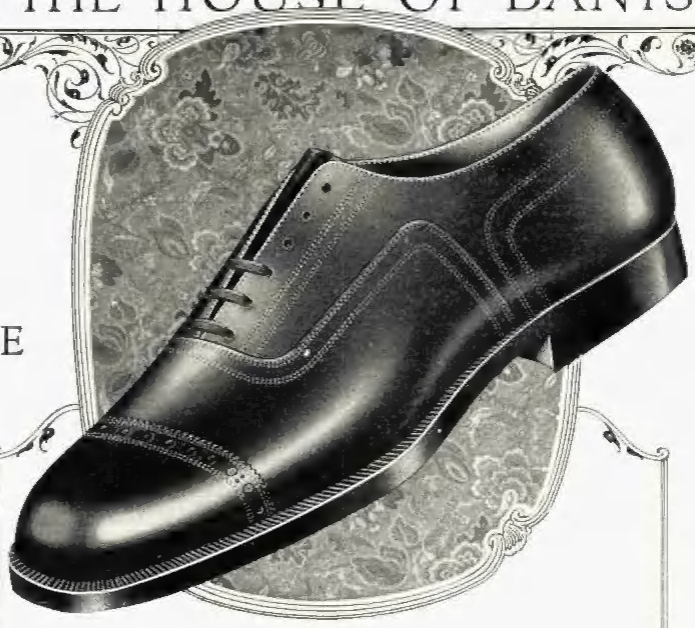
FROM THE HOUSE OF BANISTER

The
LEAGUE



*This manner of man!*

He chooses a watch for something more than accuracy. His clothes are an unconscious symbol of his own qualities and tastes.

In shoes, he demands more than comfort and style. Arbitrarily...Banister Shoes.

It is indicative of the man brought up to cherish fine things, uphold family traditions and to carry, even into his choice of things to wear, an individual judgment that invariably seeks out the best.

Such men, and their forebears for eighty years, have chosen Banister Shoes.

*Are you acquainted with a Banister dealer? If not, please write to us and permit us to send you the names of those nearest you.*

JAMES A. BANISTER COMPANY
Newark, New Jersey

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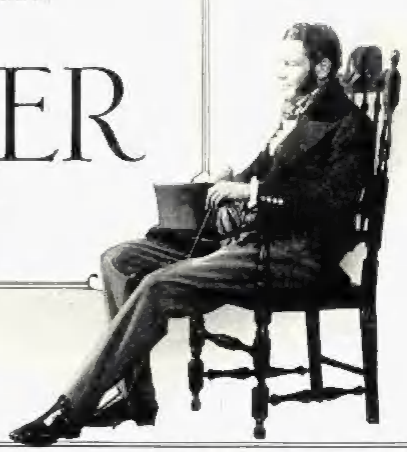
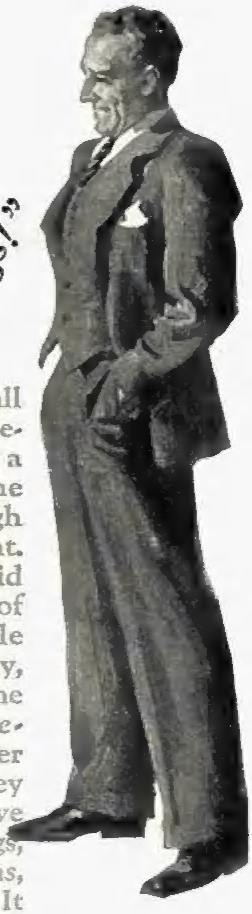


SINCE 1845 THE CHOICE OF GENTLEMEN



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"$6.25 DOWN!—that was all I paid to have my Hoover delivered. Each day I put away a few cents. By the end of the month I had more than enough to meet the small payment. And now it's mine—all paid for!" No wonder he's proud of her. In fact, she's just a little proud of herself. And happy, too! For she has found in The Hoover her *complete home-cleaning* servant. It *beats* her rugs—and she's discovered they *need* beating. (You can prove this, too*...) It *sweeps* her rugs, electrically. It *suction-cleans*, and does all her "dusting." It saves a lot of her time and most of her labor. Her rugs wear longer—and how beautiful they are! You'd be proud, too, if you were in her place. When will you be? Your Authorized Hoover Dealer will deliver *your* Hoover for *$6.25 down.* And you, too, can buy it without touching your savings.

# *The* HOOVER

***It BEATS ... as it Sweeps as it Cleans***

*TO PROVE RUGS NEED BEATING: Turn over a corner of a rug; with the handle of an ordinary table-knife, or something of equal weight, give the under or warp side 15 to 25 sharp *taps* and watch the dirt dance out from the nap depths onto a piece of paper. Feel the destructive character of this grit. This is the dirt your present cleaning methods have missed, *and that beating has dislodged.* Correct use of The Hoover causes this embedded dirt to be *vibrated* to the surface by the rapid, gentle *beating* of the Hoover brush, as powerful suction *lifts* the rug from the floor and draws all the beaten-out, swept-up dirt into the dust-tight bag

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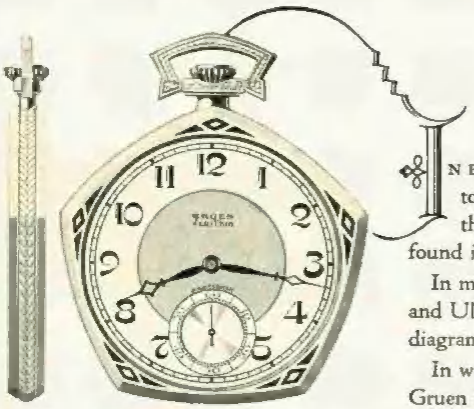

*Pentagon 154 (Pat'd)*
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This pledge mark of the GRUEN Guild is placed upon those watches of higher quality and finer finish
*Pay a little more and get the best*

IN EVERY TYPE of Gruen watch you will find technical improvements to adapt the particular movement to its particular use. Many of these improvements are patented by the Gruen Guild and are to be found in watches of no other make.

In men's pocket watches by Gruen are embodied the Gruen VeriThin and Ultra-VeriThin principles of watch construction, explained by the diagram below.

In women's wrist watches by Gruen is embodied the principle of the Gruen Cartouche. By placing an oblong movement in an oblong case, the Gruen Guild takes advantage of every bit of space to make the necessarily tiny movement as large and strong as possible.

Similar to the Cartouche principle is that employed in the man's strap watch shown above. The movement, instead of round, is made rectangular to gain space. The result is greater size and durability of parts, permitting greater accuracy.

The better jewelers can show you these watches, as well as a large variety of others by the Gruen Guild. Their stores are marked by the Gruen Service emblem.

GRUEN WATCH MAKERS GUILD
Time Hill, CINCINNATI, U. S. A.
Canadian Branch, Toronto
*Engaged in the art of fine watchmaking for more than half a century*

# GRUEN GUILD WATCHES

*Wheel train diagram, showing how the four operating planes of the ordinary watch are reduced to three in the Gruen VeriThin and two in the Ultra-VeriThin. Thus thinness is secured without loss in accuracy or durability of parts*

# THE ARCTIC REGIONS

PREPARED IN THE MAP DEPARTMENT OF THE
NATIONAL GEOGRAPHIC SOCIETY FOR THE
NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

Scale 1:14,673,400 or 231.6 miles to 1 inch

STATUTE MILES

KILOMETERS

Azimuthal Equidistant Projection - Pole of Projection at North Pole

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## EXPLANATION

- Angles of Variation of the Magnetic Compass from the True North shown by Red Arrows
- Routes of Explorers
- Warm Ocean Currents
- Cold Ocean Currents
- Glaciers and Ice Caps
- Course of Icebergs
- Railways
- H.B.Co. Hudson's Bay Co. Stations

The approximate elevation of the land is indicated by color, viz:

- Over 6000 feet
- 2000 to 6000 feet
- 600 to 2000 feet
- Sea level to 600 feet

## SPITSBERGEN AND FRANZ JOSEF LAND

STATUTE MILES

Conical Projection
Standard parallels: 78 and 81°

## ELLESMERE ISLAND REGION

STATUTE MILES

Conical Projection
Standard parallels 77 and 82°

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